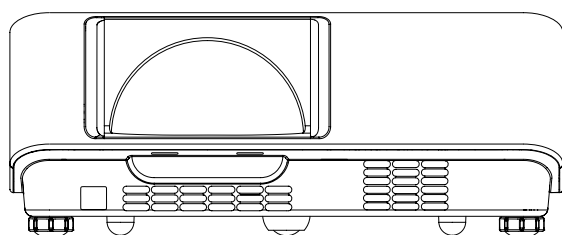


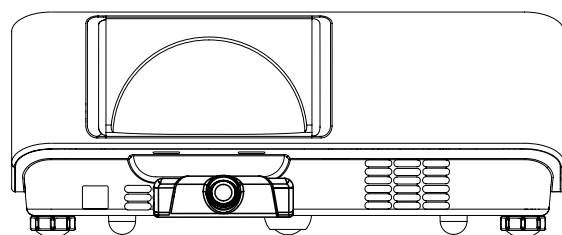
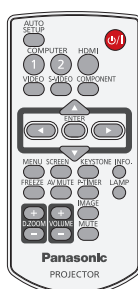
Service Manual

LCD Projector

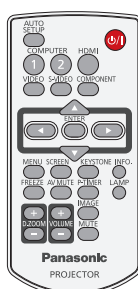
Model No. **PT-TW230U**
PT-TW230E
PT-TW230EA
PT-TW231RU
PT-TW231RE
PT-TW231REA



PT-TW230



PT-TW231R



* Model PT-TW231R has an interactive module on the cabinet front.
 The illustrations in this manual are used for the model PT-TW230.

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Safety Instructions

The service technician is required to read and follow the "Safety Precautions" and "Important Safety Notice" in this service manual.



WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.



WARNING : Use UV Radiation eye and skin protection during servicing

CAUTION

Precaution

If using of this projector at high altitudes (above 1,200m), "Fan Control" to "ON1" or "ON2".
(Refer to "PROJECTOR SETUP menu" in Operating Instructions.)
Failure to observe this may cause malfunctions. Never use this projector at an altitude of 2,700m or higher.
Using this projector at high altitude, consult your dealer or Authorized Service Center about preparations.

About lead free solder (PbF)

This projector is using the P.C.Board which applies lead free solder.
Use lead free solder in servicing from the standpoint of antipollution for the global environment.

Notes:

- Lead free solder: Sn-Ag-Cu (tin, silver and copper) has a higher melting point (approx. 217°C) than standard solder. Typically the melting point is 30~40 °C higher. When servicing, use a high temperature soldering iron with temperature limitation function and set it to 370 ± 10 °C.
- Be precautionous about lead free solder. Sn-Ag-Cu (tin, silver and copper) will tend to splash when heated too high (approx. 600°C or higher).
- Use lead free solder for the P.C.Board (specified on it as "PbF") which uses lead free solder. (When you unavoidably use lead solder, use lead solder after removing lead free solder. Or be sure to heat the lead free solder until it melts completely, before applying lead solder.)
- After soldering to double layered P.C.Boards, check the component side for excess solder which may flow onto the opposite side.

About the identification of the lead free solder P.C.Board.

For the P.C.Board which applies lead free solder, the symbol as shown in the figure below is printed or stamped on the surface or the back of P.C.Board.



For US

IMPORTANT SAFETY NOTICE

There are special parts used in Panasonic LCD Projectors which are important for safety. These parts are shaded on the schematic diagram. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of PANASONIC SOLUTIONS COMPANY.

WARNING:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, The user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION : Any unauthorized changes or modifications to this equipment will void the user's authority to operate this device.

Safety precautions

1.1. General Guidelines

- For continued safety, no modification of any circuit must be attempted.
- Unplug the power cord from the power outlet before disassembling this projector.
- Use correctly the supplied power cord and must ground it.
- It is advisable to use an isolation transformer in the AC power line before the service.
- Be careful not to touch the rotation part (cooling fan, etc.) of this projector when you service with the upper case removed and the power supply turned ON.
- Observe the original lead dress during the service. If a short circuit is found, replace all the parts overheated or damaged by the short circuit.
- After the service, all the protective devices such as insulation barriers, insulation papers, shields, and isolation R-C combinations must be properly installed.
- After the service, check the leakage current to prevent the customer from getting an electric shock.

1.2. Leakage Current Check

1. Prepare the measuring circuit as shown in Fig.1.
Be sure to use a voltmeter having the performance described in Table 1.
2. Assemble the circuit as shown in Fig. 2. Plug the power cord in a power outlet.
3. Connect M1 to T1 according to Fig. 2 and measure the voltage.
4. Change the connection of M1 from T1 to T2 and measure the voltage again.
5. The voltmeter must read 0.375 V or lower in both of steps 3 and 4. This means that the current must be 0.75mA or less.
6. If the reading is out of the above standard, the projector must be repaired and rechecked before returning to the customer because of a possibility of an electric shock.

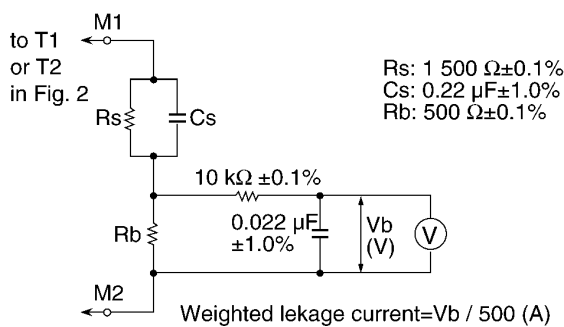


Fig. 1

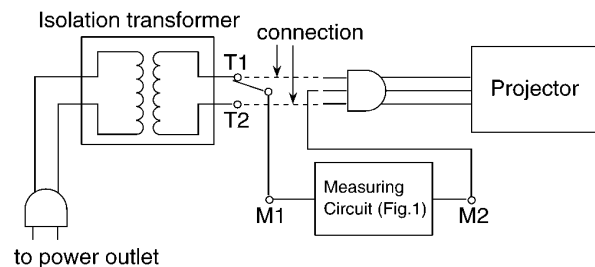


Fig. 2

	Performance
Voltmeter (rms reading)	Accuracy: $\leq 2\%$
	Input resistance: $\geq 1\ \text{M}\Omega$
	Input capacitance: $\leq 200\ \text{pF}$
	Frequency range: 15 Hz to 1 MHz

Table. 2

1.3. UV Precaution and UHM Lamp Precautions

- Be sure to unplug the power cord from the power outlet when replacing the lamp.
- Because the lamp reaches a very high temperature during its operation, wait until it cools completely when replacing the Lamp Unit.
- The lamp emits small amounts of UV-radiation, avoid direct-eye contact with the light.
- The lamp unit has high internal pressure. If improperly handled, explosion might result.
- Because the high pressure lamp involves a risk of failure, never touch the lamp wire lead during the service.

Specifications

Model No.		PT-TW230U / E / EA	PT-TW231RU / E / EA	
Power supply		AC100 V - 240 V 50 Hz/60 Hz		
Power consumption		100 V - 240 V 3.6 A-1.8 A 310 W		
		When [Standby mode] of [Setting] is set to [ECO]: 0.42 W		
		When [Standby mode] of [Setting] is set to [Network]: 9.5 W		
LCD panel	Panel size	1.5 cm(0.59") (aspect ratio 16 : 10)		
	Display method	3 transparent LCD panels (RGB)		
	Drive method	Active matrix method		
	Pixels	1024 000 (1 280 x 800) x 3 panels		
Lens		Manual focus F 1.8, f=6.68 mm		
Luminous lamp		230 W UHM lamp		
Light output *1		2500 lm		
Appli- cable scanning frequency *2	for RGB signal	Horizontal 15 kHz to 100 kHz, Vertical 50 Hz to 100 Hz		
		Dot clock frequency: 140 MHz or less		
	for YPBPR signal	[525i(480i)]	Horizontal 15.75 kHz, Vertical 60 Hz	
		[525p(480p)]	Horizontal 31.5 kHz, Vertical 60 Hz	
		[750(720)/60p]	Horizontal 45 kHz, Vertical 60 Hz	
		[1125(1080)/60i]	Horizontal 33.75 kHz, Vertical 60 Hz	
[625i(576i)]		Horizontal 15.63 kHz, Vertical 50 Hz		
for Video signal (in- cluding S-Video)	[625p(576p)]	Horizontal 31.25 kHz, Vertical 50 Hz		
	[750(720)/50p]	Horizontal 37.5 kHz, Vertical 50 Hz		
	[1125(1080)50i]	Horizontal 28.13 kHz, Vertical 50 Hz		
	• HD/SYNC and V terminals are not compliant with 3 value composite SYNC			
	Horizontal 15.75 kHz / 15.63 kHz, Vertical 50 Hz / 60 Hz			
for HDMI signal		525p(480p), 625p(576p), 750(720)/60p, 750(720)/50p, 1125(1080)/60p, 1125(1080)/50p, 1125(1080)/60i, 1125(1080)/50i ● Displayable resolution: VGA to WUXGA (non-interlace) ● Dot clock frequency: up to 162 MHz		
Color system		7 (NTSC, NTSC4.43, PAL, PAL-N, PAL-M, SECAM, PAL60)		
Projection size		1.52 m-2.79 m(60"-110")		
Screen aspect ratio		16 : 10		
Projection scheme		Front / Rear / Mount on Ceiling / Floor (Menu setting system)		
Speaker		1(3.7 cm round-type)		
Maximum usable volume output		10W		
Contrast ratio *1		500 : 1 (all white / all black)		

*1: Measurement, measuring conditions and method of notation all comply with ISO21118 international standards.

*2: For details of video signals that can be projected using this projector, refer to "List of compatible signals".

Specifications

Model No.		PT-TW230U / E / EA	PT-TW231RU / E / EA
Terminals	COMPUTER IN 1/ COMPONENT IN	1 (D-sub 15 pin female) [RGB signal] 0.7 V [p-p] 75 Ω (When G-SYNC: 1.0 [p-p] 75 Ω HD/SYNC TTL high impedance, automatic positive/negative polarity compatible VD TTL high impedance, automatic positive/negative polarity compatible [YP _B P _R signal] Y: 1.0 V [p-p] including synchronization signal, P _B P _R : 0.7 V [p-p] 75 Ω	
	COMPUTER IN 2/ MONITOR OUT	[RGB signal] 0.7 V [p-p] 75 Ω (When G-SYNC: 1.0 [p-p] 75 Ω HD/SYNC TTL high impedance, automatic positive/negative polarity compatible VD TTL high impedance, automatic positive/negative polarity compatible	
	VIDEO IN	1 (RCA pin jack 1.0 V [p-p] 75 Ω)	
	S-VIDEO IN	1 (Mini DIN 4 pin, Y 1.0 V [p-p], C 0.286 V [p-p] 75 Ω, S1 signal compatible)	
	HDMI IN	1 (HDMI 19 pin, HDCP and Deep color compatible)	
	AUDIO IN	1 (M3 stereo mini jack, 0.5 V [rms], input impedance 22 Ω and more) 1 (RCA pin jack x 2 (L-R), 0.5 V [rms], input impedance 22 Ω and more)	
	AUDIO OUT	1 (M3 stereo mini jack, stereo monitor output compatible, 0 V [rms] to 2.0 V [rms] valuable, output impedance 2.2 kΩ and less)	
	CONTROL PORT	1 (D-sub 9 pin, RS-232C compliant, for computer control use)	
	LAN	1 (for RJ-45 network connection, PLink compatible)	
Power cable length		2.0 m(78 3/4")	
Cabinet		Molded plastic	
Dimensions		Width: 350 mm (13.78") (excluding protractions) Height: 143.4 mm (5.09") (when front adjustable foot shortened) Depth: 381.9 mm (15.04") (excluding protractions)	
Weight		Approx.4.7 kg(10.4 lbs.) *3	
Operating environment		Operating environment temperature: 0 °C (32 °F) to 35 °C (95 °F) Operating environment humidity: 20 % to 80 % (no condensation)	
Remote control	Power supply	DC 3 V (battery (AAA/R03 or AAA/LR03 Type) x 2)	
	Operating range	Approx. 5 m (196.9") (when operated directly in front of receptor)	
	Weight	67 g (2.36 ozs.) (including batteries)	
	Dimensions	Width : 52 mm (2.05"), Length : 110 mm (4.33"), Height : 18 mm (0.71")	

*3: This is an average value. It may differ depending on individual product.

- The part numbers of accessories and separately sold components are subject to change without notice.

Circuit Protections

This projector provides the following circuit protections to operate in safety. If the abnormality occurs inside the projector, it will automatically turn off by operating one of the following protection circuits.

Thermal fuse(SW902)

There is the thermal fuse (SW902) inside of the projector to detect the internal temperature rising abnormally. When the internal temperature reaches near 94°C, the thermal fuse opens to cut off the power to the power circuit.

If the thermal fuse opens, the projector cannot turn on. Thermal fuse replacement is required.

Lamp cover switch(SW901)

The lamp cover switch (SW901) cuts off the drive signal to the lamp circuit when the lamp cover is removed or not closed completely. After opening the lamp cover for replacing the lamp ass'y, place the lamp cover correctly otherwise the projector can not turn on.

Fuse(F601)

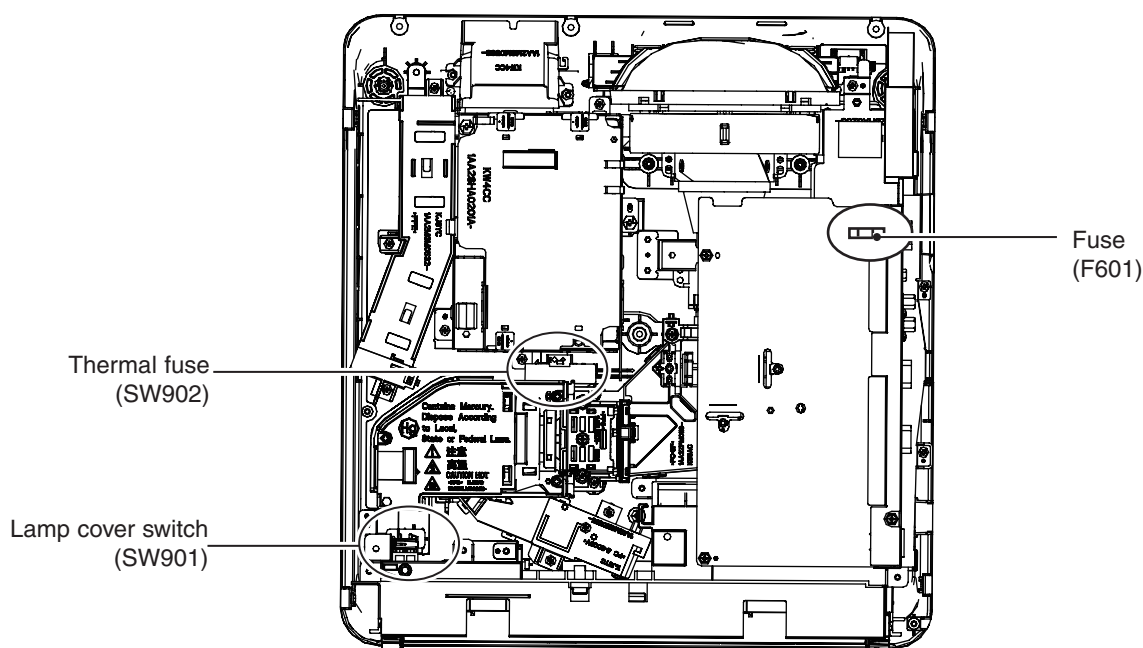
A fuse is located inside of the projector. When the ON(G)/STANDBY(R) indicator is not lighting, the fuse may be opened. Check the fuse as following steps.

The fuse should be used with the type listed right;

Fuse Part No. : 423 034 4101
TYPE T6.3AH 250V FUSE
Hollyland Co, Ltd. TYPE 50CT063H

How to replace the fuse

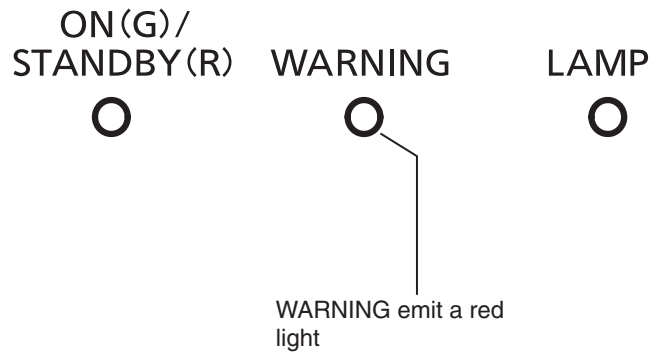
1. The fuse is placed on the filter board behind the main board. Remove the cabinet top, AV panel and main board.
2. Take the fuse off, and replace the old one with the specified type.



Warning temperature and power failure protection

The projector will be automatically turned off when the internal temperature of the projector is abnormally high, or the cooling fans stop spinning, or the power supplies in the projector are failed.

LED indicator



The projector is shut down and the WARNING indicator is blinking red.

When the temperature inside the projector reaches a certain level, the projector will be automatically shut down to protect the inside of the projector and the WARNING and ON(G)/STANDBY(R) indicators start blinking. When the projector has cooled down enough (to its normal operating temperature), the ON(G)/STANDBY(R) indicator stops blinking and lights red. The projector can be turned on again by pressing the button.

✓ Note:

The WARNING indicator continues to blink even after the temperature inside the projector returns to normal. When the projector is turned on again, the WARNING indicator stops blinking.

Check items

- Remove dust around the air filter unit.
- Ventilation slots of the projector are blocked. In such an event, reposition the projector so that ventilation slots are not obstructed.
- Check if projector is used at higher temperature place (Normal operating temperature is 0 °C to 35 °C or 32 °F to 95 °F)

The projector is shut down and the WARNING indicator lights red.

When the projector detects an abnormal condition, it is automatically shut down to protect the inside of the projector and the WARNING indicator lights red. In this case, unplug the AC power cord and reconnect it, and then turn the projector on once again to verify operation.

✓ Note:

- If the WARNING indicator lights red, it may defect the cooling fans or power supply circuits. Check fans operation and power supply lines referring to the chapter "Power supply & protection circuit" and "Fan control circuit" in the Chassis Block Diagram section.



WARNING

DO NOT LEAVE THE PROJECTOR WITH THE AC POWER CORD CONNECTED UNDER AN ABNORMAL CONDITION. IT MAY RESULT IN FIRE OR ELECTRIC SHOCK.

Maintenance

Before replacing the unit

When you perform maintenance or replacement of the parts, be sure to turn off the power and disconnect the power plug from the wall outlet.

Maintenance

■ Outer case

Wipe off dirt and dust using a soft dry cloth.

- If the dirt is persistent, soak the cloth with water and wring it thoroughly before wiping. Dry off the projector with a dry cloth.
- Do not use benzene, thinner, or rubbing alcohol, other solvents, household cleaners, or chemical treated dusters. Using them may cause deterioration of the outer case.

■ Front glass surface of the lens

Wipe off the dirt and dust off the front surface of the lens with soft clean cloth.

- Do not use a cloth that has an abrasive surface or a cloth that is moist, oily, or covered with dust.
- Do not use excessive force when wiping the lens as it is fragile.

Attention

The lens is made of glass. Impacts or excessive force when wiping may scratch its surface. Please handle with care.

Replacing the unit

■ Air filter unit

Filter prevents dust from accumulating on the optical elements inside the projector. Should the filter become clogged with dust particles, it will reduce cooling fans' effectiveness and may result in internal heat buildup and adversely affect the life of the projector. If a "Filter warning" icon appears on the screen, replace the filter immediately.

■ Replacement of the air filter unit

1) Remove the air filter cover.

- Clean up the dust on the projector and around the air vents. Press and hold the right-hand corner of the filter cover and then press ◀ leftwards on the filter cover to release the latch and open the filter cover.

2) Replace the air filter unit.

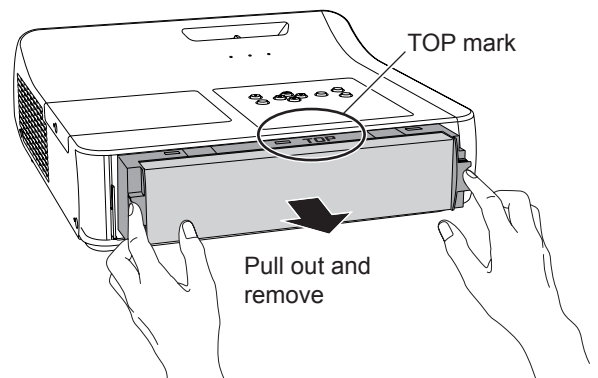
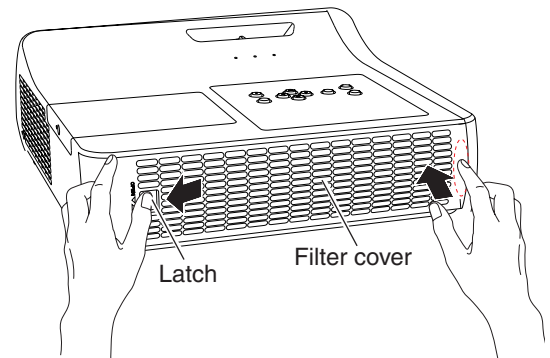
- Put your fingers on the filter tab and then pull the air filter unit out of the projector.

3) Insert a new air filter unit.

- Insert the new filter unit completely by following the instructions for step 2) in the reverse order. Ensure that the area with "TOP" mark is in an upward direction.

4) Place the air filter cover

- Place the air filter unit cover by following the instructions for step 1) in the reverse order.



Replacement air filter unit : ET-RFT100

■ Resetting the filter counter

After replacing the filter, be sure to reset the filter counter.

1) Press ▲▼ to select [Filter counter reset].

2) Press <ENTER> button.

[Filter counter Reset?] appears. Select [Yes] to continue. Another confirmation dialog box appears, select [Yes] to reset the filter counter.

Attention

- Turn off the power before you replace the air filter unit.
- When attaching the air filter unit, make sure that the projector is stable, and work in an environment that is safe, even in the event of the air filter unit dropping.
- Do not operate the projector with the filter removed. Dust may accumulate on the optical elements degrading picture quality.
- Do not put anything into the air vents. Doing so may result in malfunction of the projector.
- Do not wash the filter with water or any other liquid matter. Otherwise the filter may be damaged.

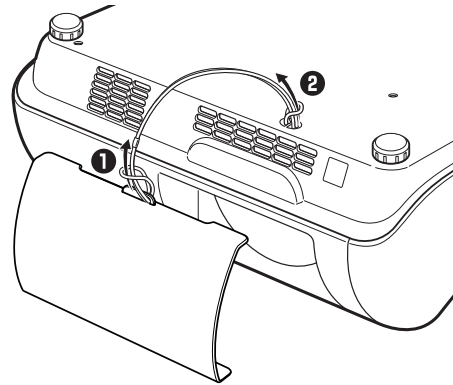
■ Attaching the lens cover

When moving this projector or while not using it over an extended period of time, attach the lens cover.

Attach the lens cover according to the following procedures.

1) Thread the string through the hole on the lens cover and then tie a knot in the string to secure it in place.

2) To pass the other end of the string into the hole on the bottom of the projector and pull at it.



■ Lamp unit

The lamp unit is a consumable component. You can check the total usage time using lamp runtime in the Information menu.

It is recommended to ask an authorized engineer to replace the lamp unit. Contact your dealer. Consult your dealer to purchase a replacement lamp unit.

Replacement lamp unit : ET-LAT100

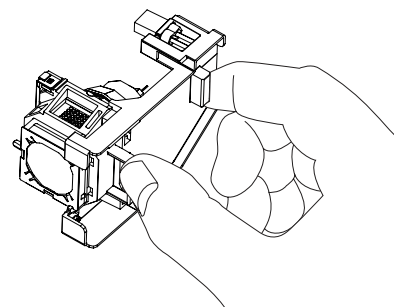
CAUTION:

■ Do not replace the lamp unit when it is hot. (Wait at least 1 hour after use.)

The inside of the cover can become very hot, take care to avoid burn injuries.

■ Notes on the replacement of the lamp unit

- The luminous source of the lamp is made of glass and may burst if you hit it against a hard surface or drop it. Please handle with care.
- A Phillips screwdriver is required for replacement of the lamp unit.
- When replacing the lamp unit, be sure to hold it by the handle.
- When replacing the lamp because it has stopped illuminating. There is a possibility that the lamp may be broken. If replacing the lamp of a projector which has been installed on the ceiling, you should always assume that the lamp is broken. And you should stand to the side of the lamp cover, not underneath it. Remove the lamp cover gently. Small pieces of glass may fall out when the lamp cover is opened. If pieces of glass get into your eyes or mouth. Seek medical advice immediately.
- The lamp contains mercury. Consult your local municipality or your dealer about correct disposal of used lamp units.





Attention

- Do not use other than designated lamp units.
- The part numbers of accessories and separately sold components are subject to change without notice

■ When to replace the lamp unit

The lamp unit is a consumable component. Brightness decreases according to duration of usage, so periodical replacement of the lamp unit is necessary. When the projection lamp of the projector reaches its end of life, the lamp replacement icon appears on the screen and <LAMP> indicator lights yellow. Replace the lamp with a new one promptly.

Lamp runtime	On screen Lamp replacement icon 	LAMP indicator 
Over 3000 hours*	The message is displayed for 10 seconds. If you press any button within the 10 seconds, the message disappears.	Lights in yellow (even in stand-by mode).
Over 3200 hours*	If the power is turned on without replacing the lamp, the power automatically turns off after approximately ten minutes to prevent the malfunction of the projector.	

* 3200 hours of use is a rough guideline, but is not a guarantee. The lamp runtime differs depending on the setting of "Lamp power" menu.

Note

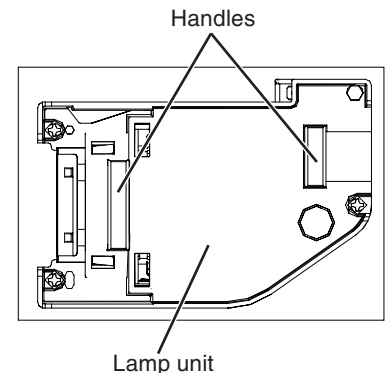
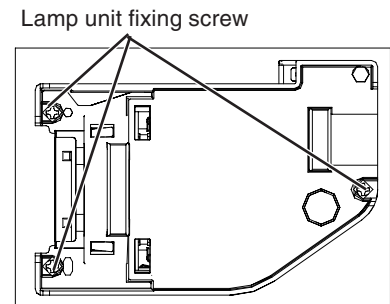
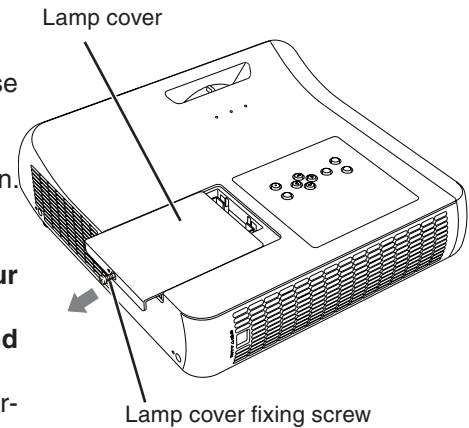
- The Lamp replacement icon will not appear when the [display] function is set to [Off], or during "Freeze", or "AV mute".

Replacing the lamp unit

CAUTION:

- When the projector is mounted on a ceiling, do not work with your face close to the projector.
- Attach the lamp unit and the lamp cover securely.
- When you experience difficulty in installing the lamp, remove it and try again. If you use force to install the lamp, the connector may be damaged.

- 1) Turn off the projector. Unplug the AC power cord. Wait at least 1 hour and make sure the lamp unit and surroundings are cool.
- 2) Use a Phillips screwdriver to loosen the lamp cover fixing screw and remove the lamp cover.
 - Remove the lamp cover by pulling it slowly toward the direction of the arrow.
- 3) Use a Phillips screwdriver to loosen the three lamp unit fixing screws until the screws turn freely. Hold the used lamp unit by its handles, and pull it gently from the projector.
- 4) Insert the new lamp unit in correct direction. Tighten the three lamp unit fixing screws securely with a Phillips screwdriver.
- 5) Attach the lamp cover, and tighten the lamp cover fixing screw securely with a Phillips screwdriver.
 - Attach the lamp cover by pushing it slowly opposite the direction of the arrow.



■ Resetting the lamp runtime

After replacing the lamp unit, be sure to reset the lamp runtime.

- 1) Press ▲▼ to select [Lamp runtime reset].
- 2) Press <ENTER> button to reset.

[Lamp runtime Reset?] appears. Select [Yes] to continue. Another confirmation dialog box appears, select [Yes] to reset the lamp runtime.

Attention

- When the lamp runtime is elapsed the estimated duration, [Lamp runtime] will be displayed in red and the lamp replacement icon will appear on the screen, indicating that the end of lamp life is reached. When replacing the lamp unit, reset the lamp runtime.


How to check lamp runtime

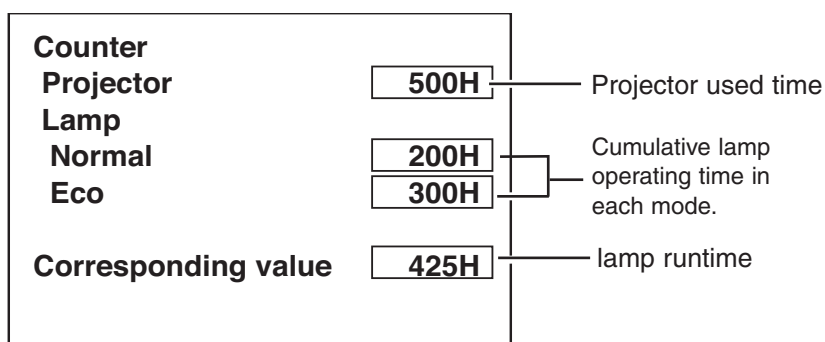
The LAMP indicator will light yellow when the lamp runtime (Corresponding value) reaches 3,000 hours. This is to indicate that lamp replacement is required. The lamp runtime is calculated by using the below expression.

Lamp runtime (Corresponding value) = $T_{\text{normal}} + T_{\text{eco}} \times 0.75$

T_{normal} : used time in the normal mode
 T_{eco} : used time in the eco mode

You can check the lamp runtime following to the below procedure.

- 1 Press and hold the  button on the projector or the remote control for more than 20 seconds.
- 2 The projector used time and lamp runtime will be displayed on the screen briefly as follows.



Cleaning

After long periods of use, dust and other particles will accumulate on the LCD panel, prism, mirror, polarized glass, lens, etc., causing the picture to darken or color to blur. If this occurs, clean the inside of optical unit. Remove dust and other particles using air spray. If dirt cannot be removed by air spray, disassemble and clean the optical unit.

Cleaning with air spray

Remove the cabinet top following to “Mechanical Disassembly”. Clean up the LCD panel and polarizing plate by using the air spray from the cabinet top opening.

Caution:

Use a commercial (inert gas) air spray designed for cleaning camera and computer equipment. Use a resin-based nozzle only. Be very careful not to damage optical parts with the nozzle tip. Never use any kind of cleanser on the unit. Also, never use abrasive materials on the unit as this may cause irreparable damage.

Disassembly Cleaning

Disassembly cleaning method should only be performed when the unit is considerable dirty and cannot be sufficiently cleaned by air spraying alone.

Be sure to readjust the optical system after performing disassembly cleaning.

1. Remove the cabinet top and main units following to “Mechanical Disassembly”.
2. Remove the optical base top following to “Optical Unit Disassembly”. If the LCD panel needs cleaning, remove the LCD panel unit following to “LCD panel replacement”.
3. Clean the optical parts with a soft cloth. Clean extremely dirty areas using a cloth moistened with alcohol.

Caution:

The surface of the optical components consists of multiple dielectric layers with varying degrees of refraction. Never use organic solvents (thinner, etc.) or any kind of cleanser on these components.

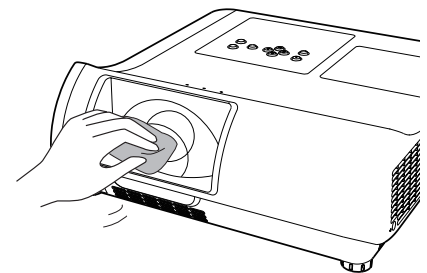
Since the LCD panel is equipped with an electronic circuit, never use any liquids (water, etc.) to clean the unit. Use of liquid may cause the unit to malfunction.

Cleaning the projection lens

Unplug the AC power cord before cleaning.

Gently wipe the projection lens with a cleaning cloth that contains a small amount of non-abrasive camera lens cleaner, or use a lens cleaning paper or commercially available air blower to clean the lens.

Avoid using an excessive amount of cleaner. Abrasive cleaners, solvents, or other harsh chemicals might scratch the surface of the lens.

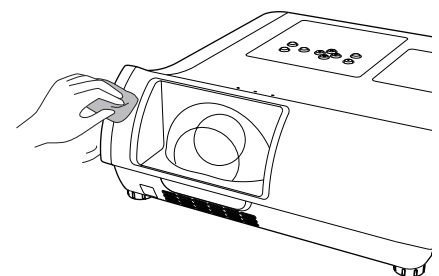


Cleaning the projector cabinet

Unplug the AC power cord before cleaning.

Gently wipe the projector body with a soft dry cleaning cloth. When the cabinet is heavily soiled, use a small amount of mild detergent and finish with a soft dry cleaning cloth. Avoid using an excessive amount of cleaner. Abrasive cleaners, solvents or other harsh chemicals might scratch the surface of the cabinet.

When the projector is not in use, put the projector in an appropriate carrying case to protect it from dust and scratches.





Security Function Notice

This projector provides security functions such as "Key lock", "PIN code lock" and "Logo PIN code lock". When the projector has set these security function on, you are required to enter correct PIN code to use the projector. If you do not know the correct PIN code to the projector, the projector can no longer be operated or started. In this case, you must reset those function first according to the resetting procedure described below and then check up on the projector.

Function	Description
Key lock	Locks operation of the top control or the remote control. If the Key lock is enabled with top control lock, the projector can no longer be started. Initial setting: Key lock function is disabled
PIN code lock	Prevents the projector from being operated by an unauthorized person. Initial code: "1234"
Logo PIN code lock	Prevents an unauthorized person for changing the start-up logo on the screen. Initial code: "4321"

Resetting procedure

1. Disconnect the AC power cord from the AC outlet.
2. As pressing the **ENTER** button, connect the AC power cord into an AC outlet again.
3. Keep pressing the **ENTER** button and then press the  button.
4. Release the  button first and then release the **ENTER** button.
 - The PIN code lock and Logo PIN code lock will be reset as the initial PIN code at the factory and the key lock function is disabled.

Please refer to the owner's manual for further information of the security functions.

Standby Mode Notice

This projector provides 2 types of standby mode, Eco standby mode and Network standby mode. According to the standby mode "Eco" or "Network", several functions are restricted as shown in the table below. To change the standby mode, use the projector's menu "Setting".

- Network..... Supply the power to the network function even after turning off the projector. You can turn on /off the projector via network, modify network environment, and receive an e-mail about projector status while the projector is powered off.
- Eco..... Select "Eco" when you do not use the projector via network. The projector's network function will stop when turning off the projector.

When "Eco" is selected, several functions will be restricted.


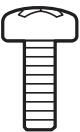
Restricted Function in the standby mode

Function	Eco	Network
Serial command control	✓ ^{*1}	✓
Network function	--	✓
Monitor out	--	✓
Audio out	--	--
Direct on	✓	✓

*1 Effective only power-on command.

Mechanical Disassembly

Mechanical disassembly should be made following procedures in numerical order.
Following steps show the basic procedures, therefore unnecessary step may be ignored.
Caution:
The parts and screws should be placed exactly the same position as the original otherwise it may cause loss of performance and product safety.

Screws expression (Type Diameter x Length) mm	
T type	M type
	

1. Filter cartridge removal

1. Press and hold the part indicated with the arrow, and press ◀ leftwards on the filter cover to release the latch and open the filter cover.
2. Pull out the filter cartridge.

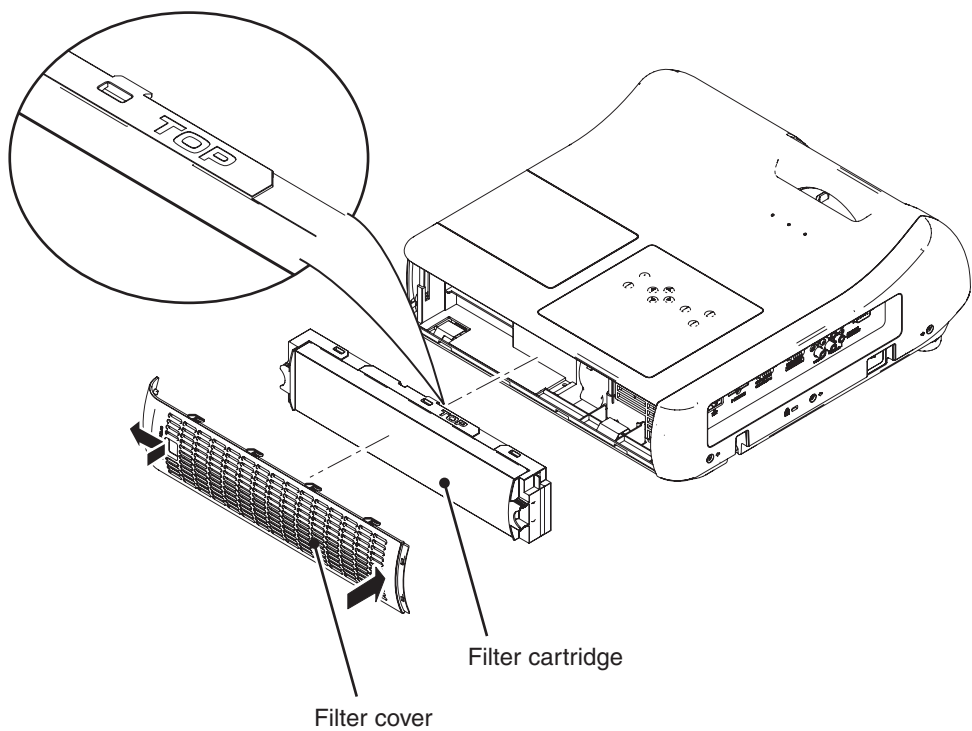


Fig.1

Note:
Do not disassemble the filter cartridge to clean up or replace the parts inside of the filter cartridge. When replacing the filter cartridge, replace whole the filter cartridge with new one to maintain the projector's performance.

2. AV panel and cabinet top removal

1. Remove 5 screws A(M3x8) to remove the AV panel.
2. Remove 3 screws B(T3x10), 1 screw C(T3x10), 2 screws D(M3x8) and 1 screw E(T3x8) and 1 screw F(T3x8) to remove the cabinet top assy.
3. Loosen 1 screw G and remove the lamp cover.
4. Remove 2 screws H(T3x8), 1 screw J(M4x6) to remove the shield plate.

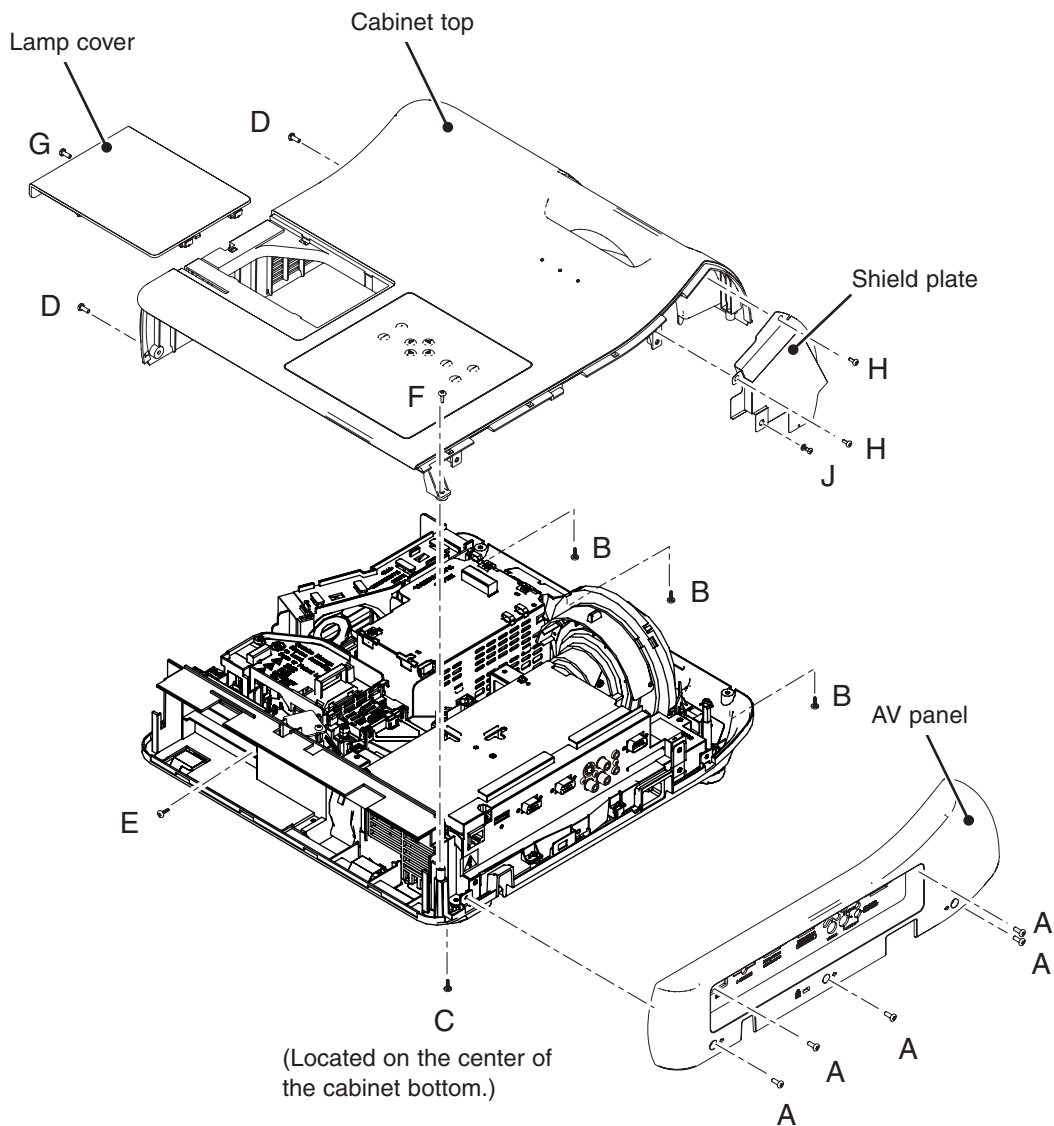


Fig.2

3. Main, filter board and lamp removal

1. Remove 1 screw A(M4x6), 2 screws B(T3x8), 2 screws C(M2.5x8) and remove the main board upward.
2. Remove 1 screw D(M4x6), 2 screws E(T3x8), 3 screws F(M4x6) and remove the filter shield top.
3. Remove 1 screw H(M3x6) and 2 screws G(T3x8) and remove the filter board upward off.
4. Loosen 3 screws J and pull the lamp upward off.

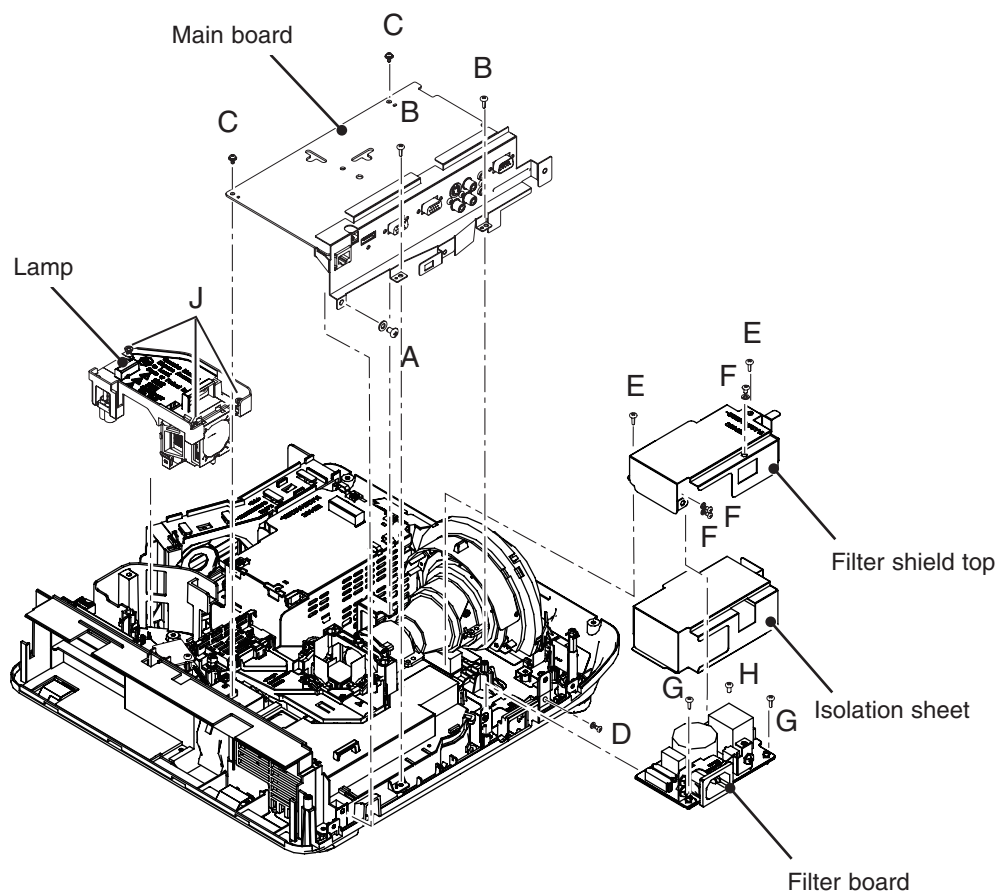


Fig.3

4. Power, SW902, ballast boards and fans(FN906, FN907) removal

1. Remove 3 screws A(T3x8) to remove the fans (FN906, FN907) assy.
2. Remove 1 screw B(T3x8) to remove the lamp socket. Remove 3 screws C(T3x8) to remove the lamp cover bottom. Unhook the ballast cable from the cabinet bottom.
3. Remove 1 screw D(T3x8) to remove the thermal fuse(SW902).
4. Remove 1 screw E(M4x6) and 4 screws F(T3x8). Disconnect the connectors "CN1" on the ballast board and "K6C" on the power board. Remove the power box top upward off.
5. Remove 1 screw G(M3x8), 2 screws H(M3x8) to remove the power board.

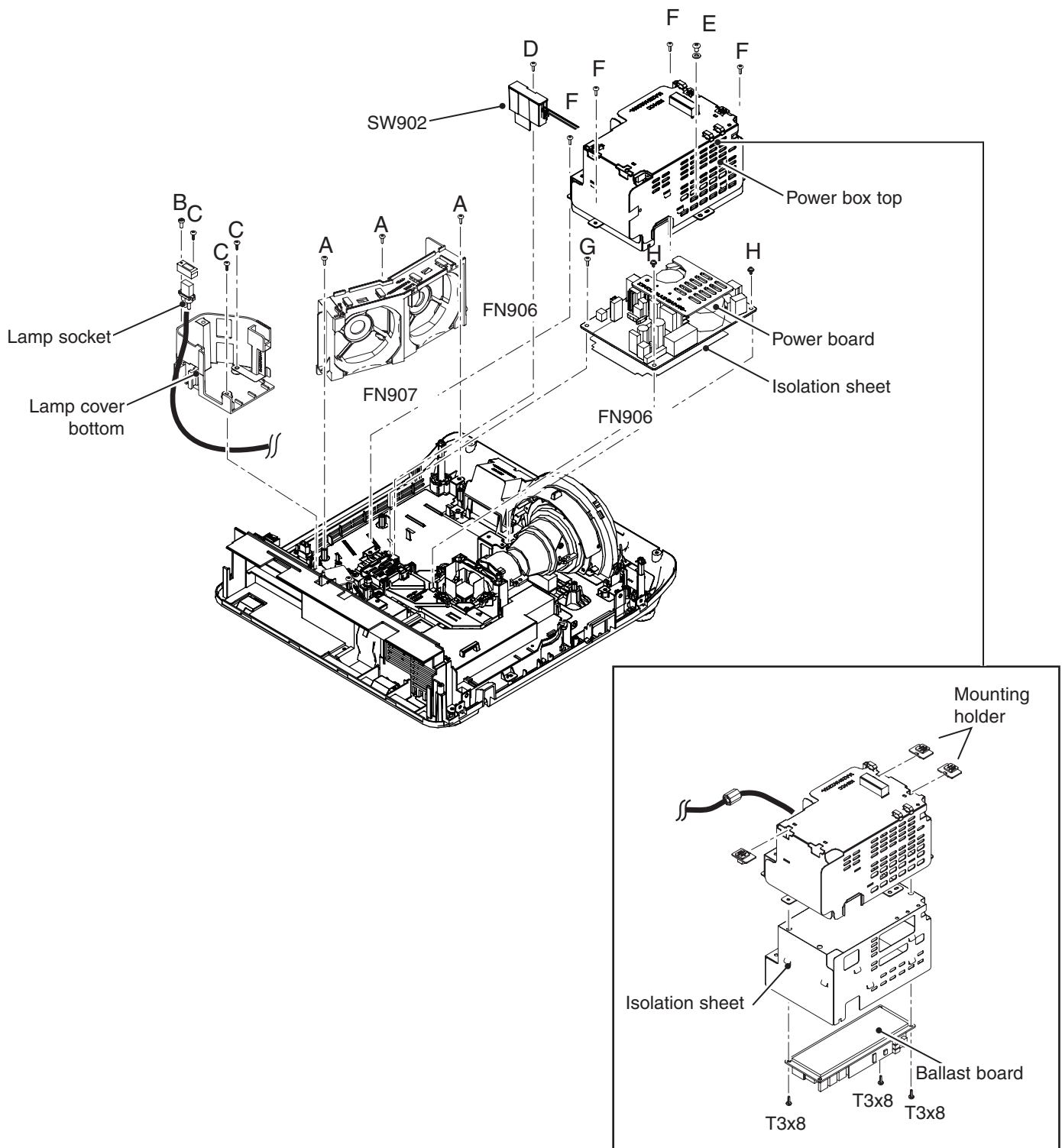


Fig.4

5. Cable reforming

Reform the cables as shown in the figure below. Place the cables at the original position after replacing the parts.

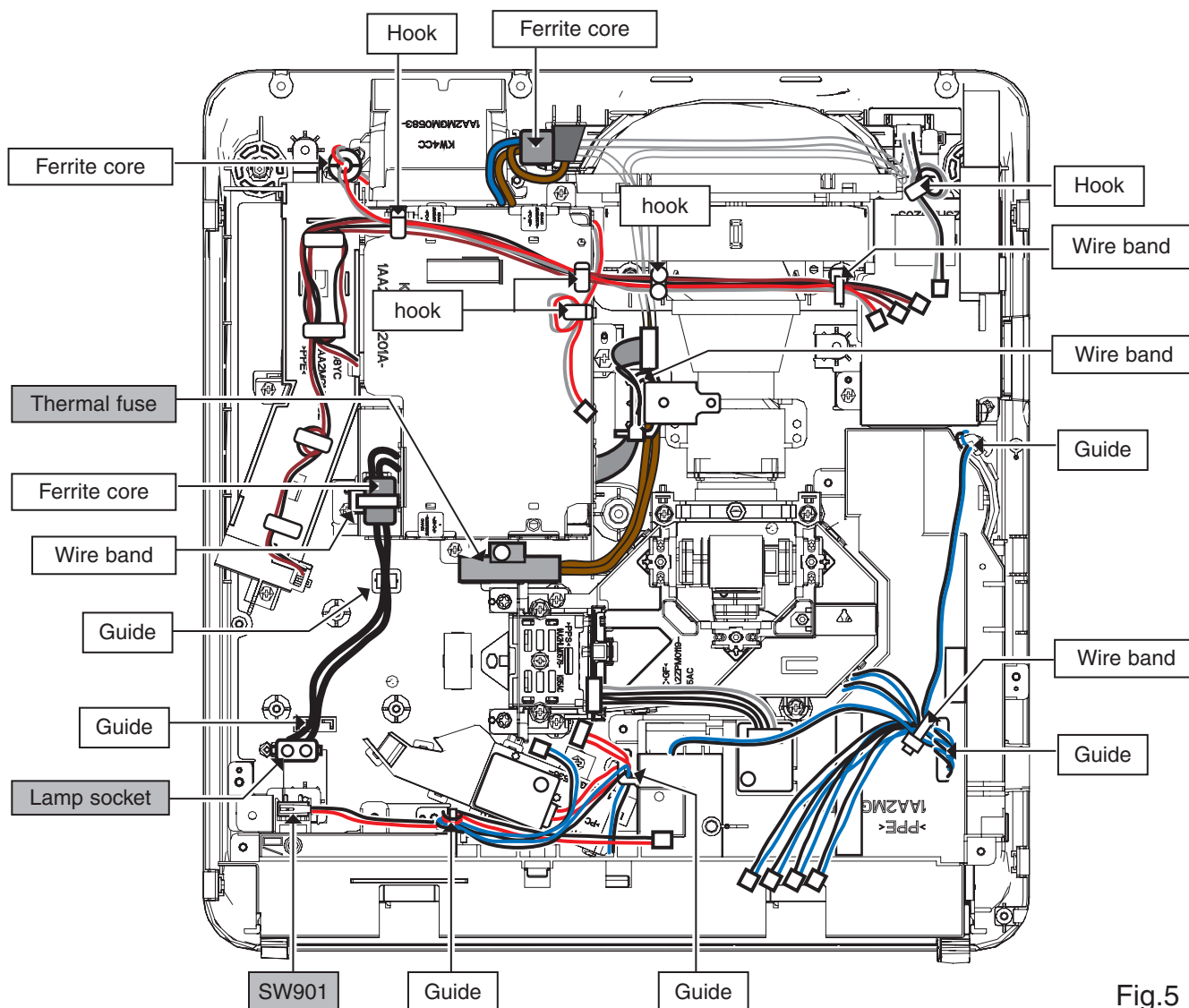


Fig.5

6. Optical unit and duct assembly removal

1. Remove 2 screws A(T3x8) to remove the main board holder.
2. Remove 2 screws B(T3x12) and 5 screws C(T3x8) and remove the optical unit upward off.
3. Remove 9 screws D(T3x8) and remove the duct assembly upward off.

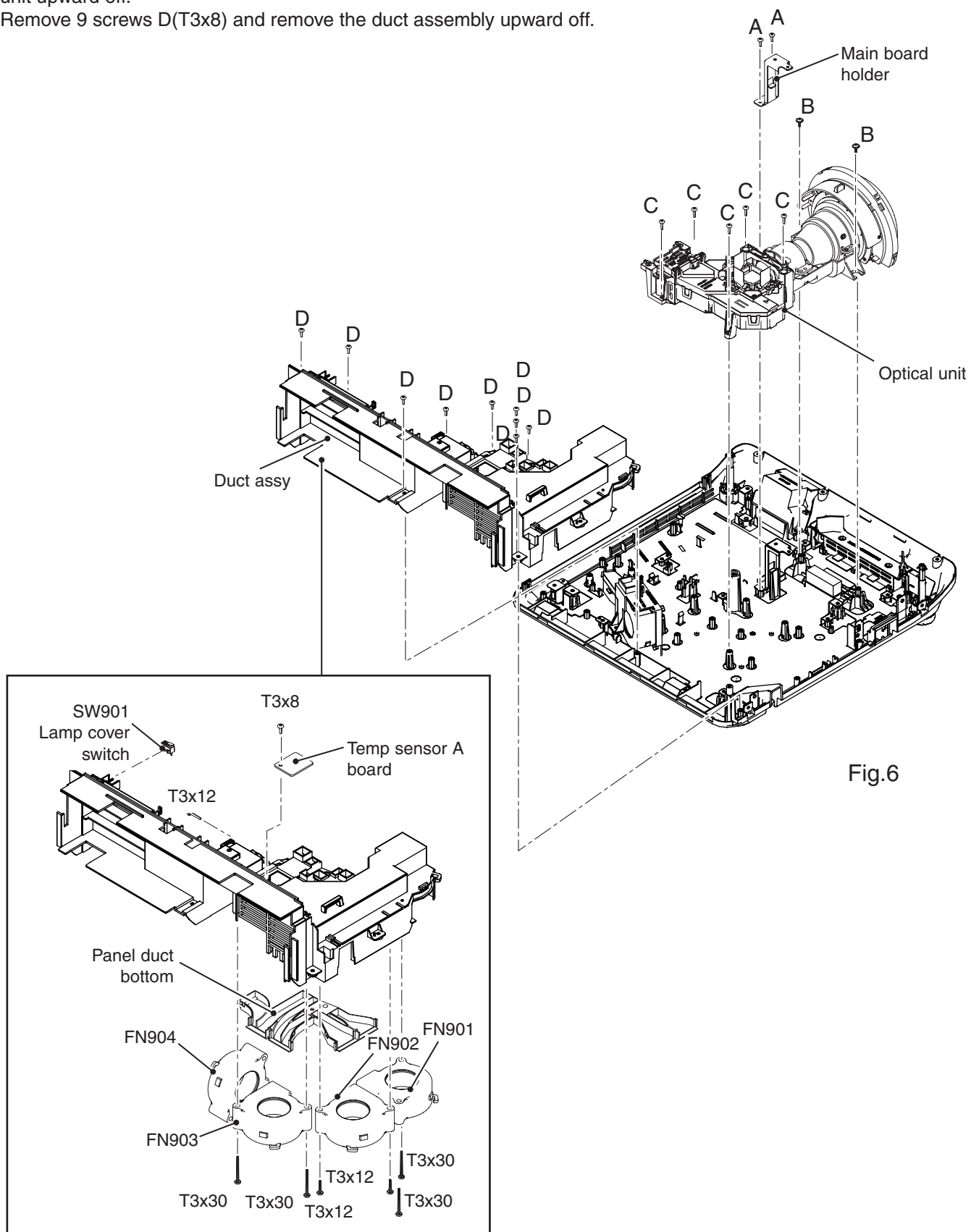


Fig.6

7. Fan(FN905),temp sensor C, R/C front board removal

1. Remove 2 screws A(T3x8) to remove the duct assy. Remove fan (FN905) and temp sensor C board.
2. Remove 2 screws B(T3x8) to remove the lens holder. Pull the R/C front board upward off.

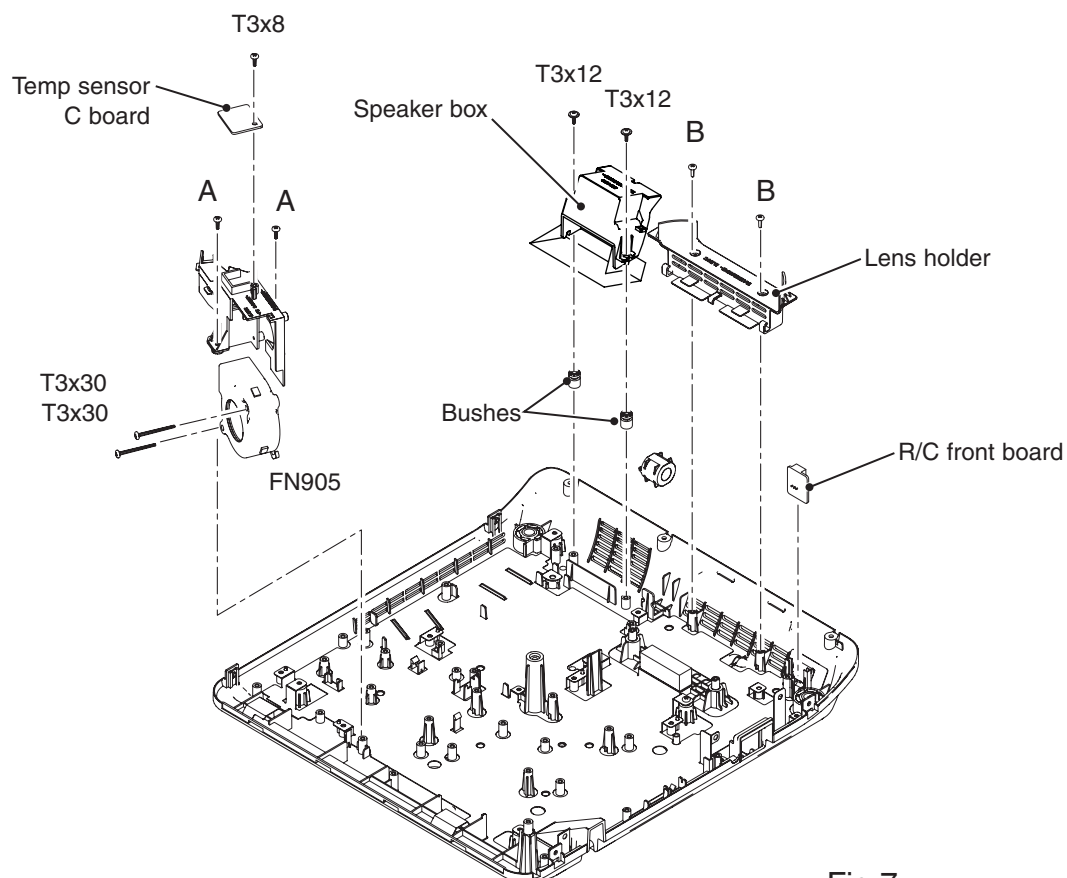


Fig.7

Optical Parts Disassembly

Before taking this procedure, remove AV panel, cabinet top and main board following to the “Mechanical disassembly”.

Disassembly requires a 2.0mm hex wrench and a screwdriver.

1 Projection lens removal

Note: The main board holder should be removed from the cabinet bottom before removing the projection lens.

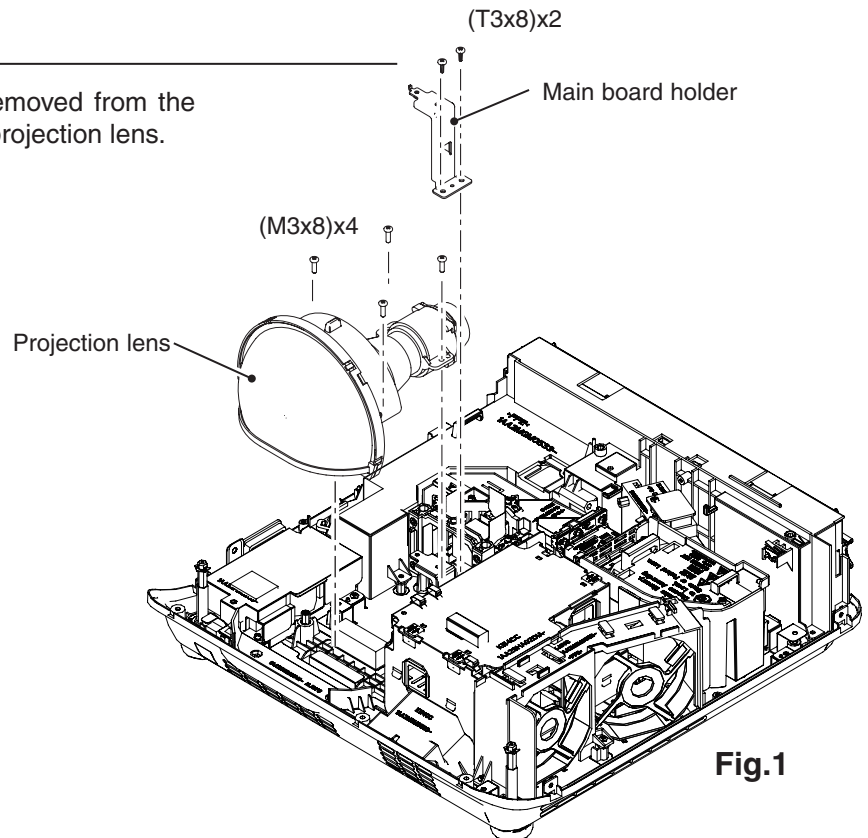


Fig.1

2 Integrator lens (OUT) & PBS removal

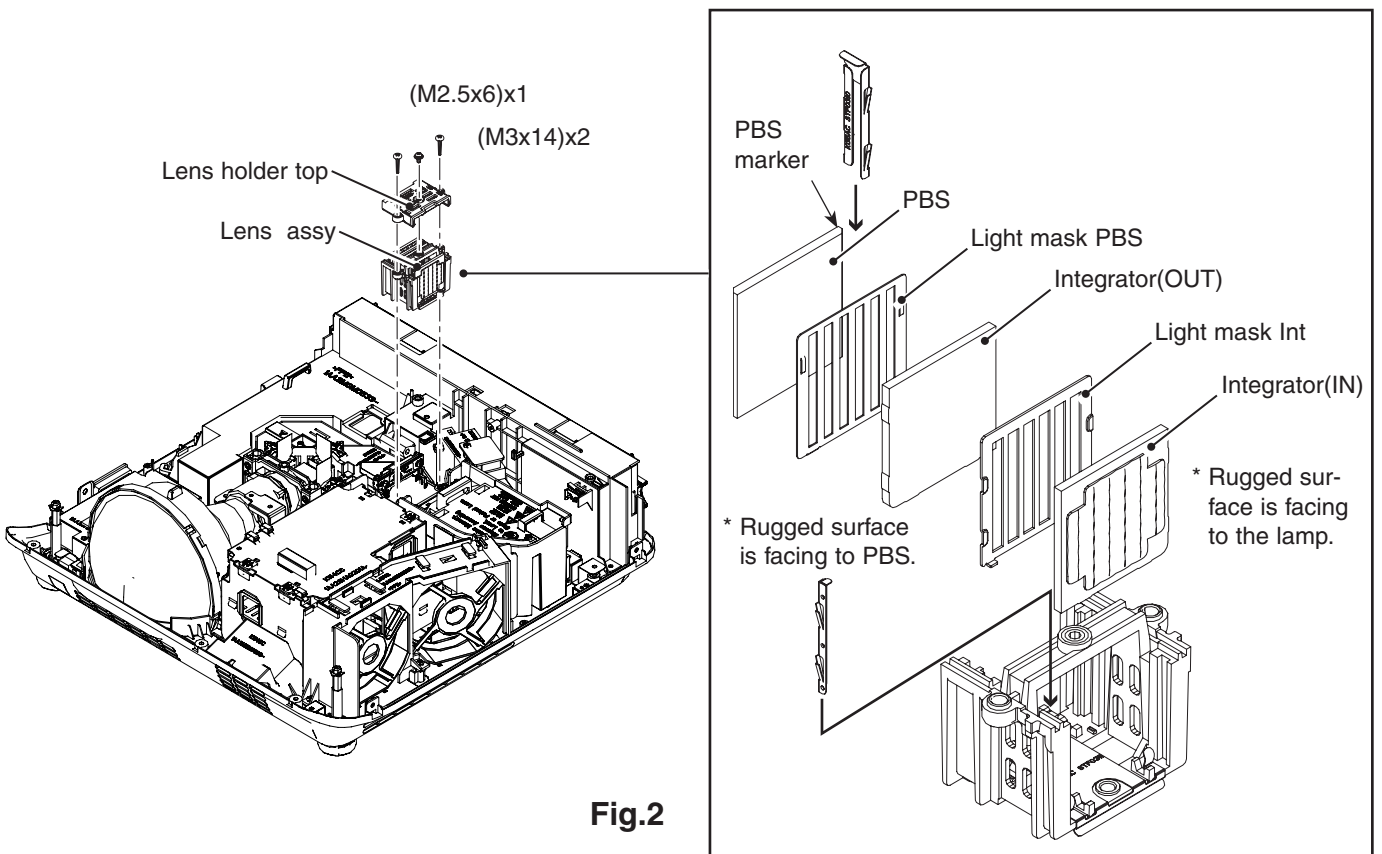
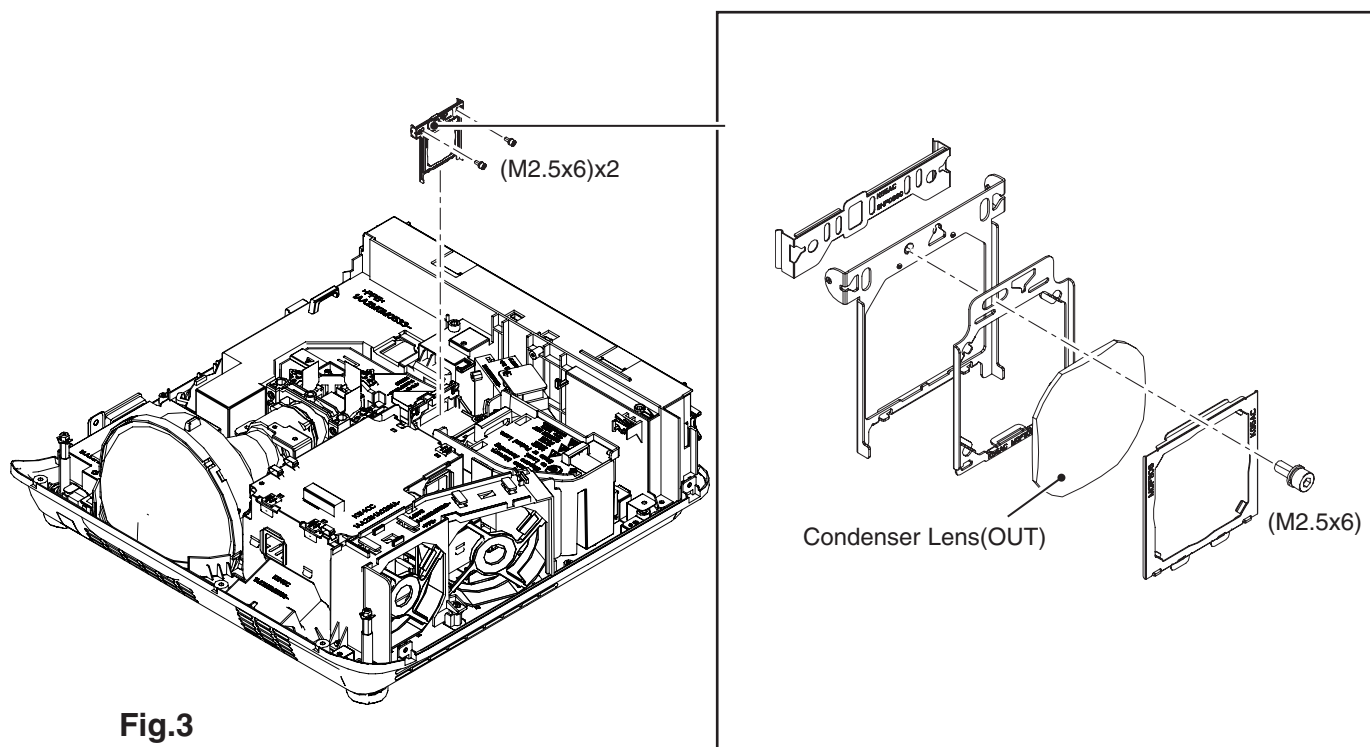
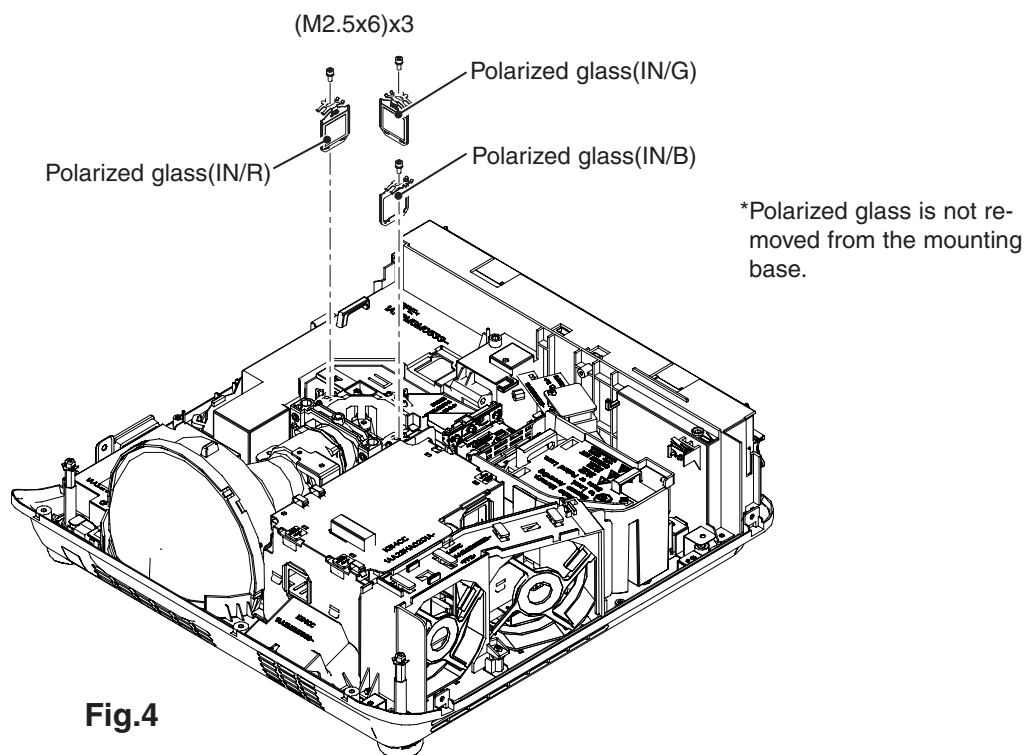


Fig.2

3 Condenser lens (OUT) removal



4 Polarized glasses removal



5 LCD panel/prism assy removal

Loosen 1 screw A and then pull the panel/prism assy upward off.

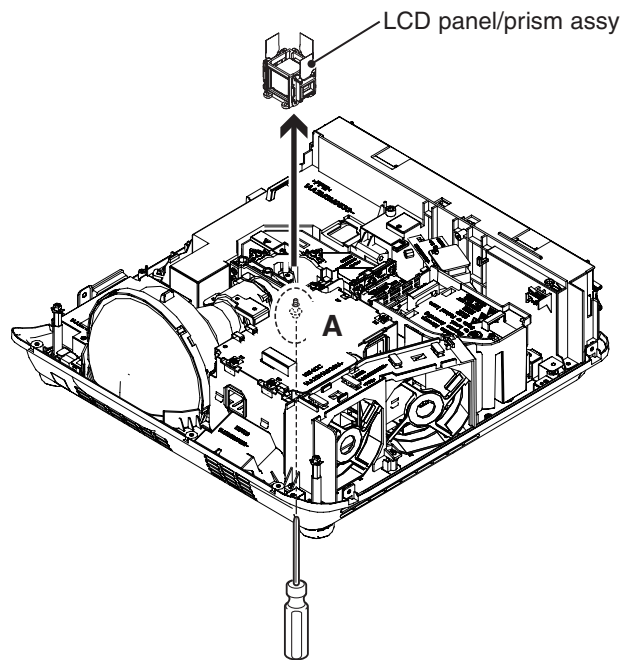


Fig.5-1

*Note on handling the LCD panel/prism assy

LCD panel, polarized glasses are very sensitive parts.

Never touch or wipe the surface. When removing the dust on the surface, use a commercial (inert gas) air spray to remove them.

Panel type check

There are 2 types of LCD panel/prism assy for this model. Either L-type or R-type LCD panel/prism assy is used on the projector. Check which type of LCD panel/prism assy is used with the figure below.

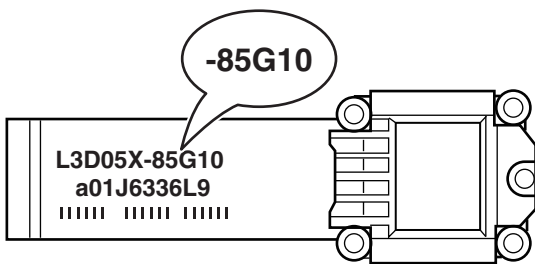
When replacing the LCD panel/prism assy, you need to take "Panel type check and setting" on the electrical adjustment for the replaced LCD panel/prism assy.

The gamma-characteristics are different between L-type and R-type LCD panel/prism assy.

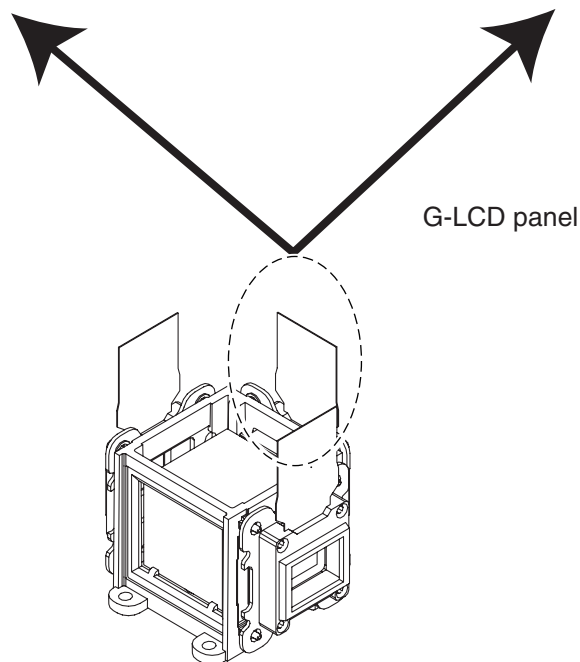
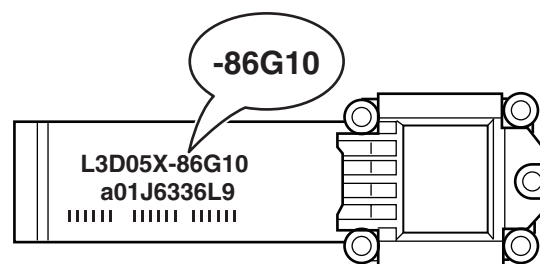
How to check the type of LCD panel/prism assy

Check the printed number on the flat cable of the G-LCD panel.

L-type LCD panel/prism assy



R-type LCD panel/prism assy



G-LCD panel

Fig.5-2

IMPORTANT NOTICE on LCD panel/prism assy replacement

LCD panels used for this model can not be replaced separately. Do not disassemble the LCD panel/prism assy. These LCD panels are installed with precision at the factory. When replacing the LCD panel, replace the whole the LCD panels and prism assy at once.

When replacing the LCD panel/prism assy, take the optical and electrical adjustments following to the "Adjustment" chapter.

6 Optical unit top removal

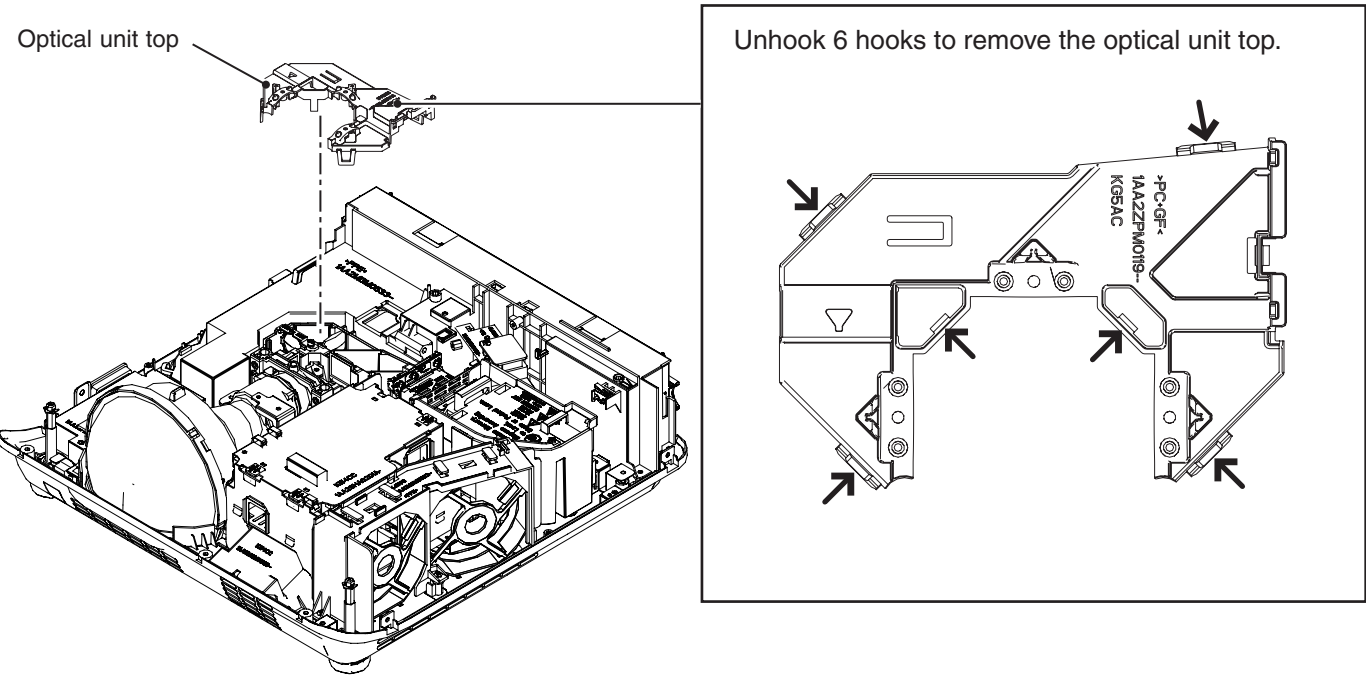


Fig.6

7 Relay lens(OUT) assy removal

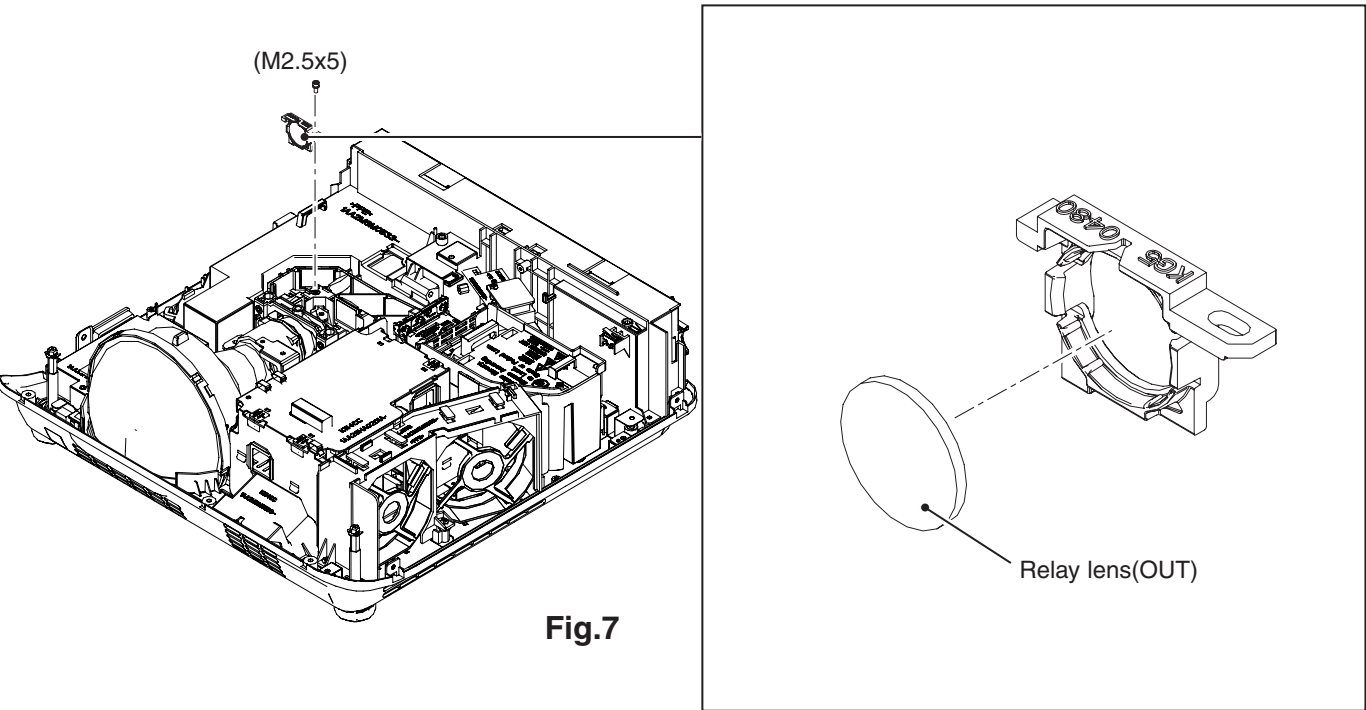


Fig.7

8 Locations and directions

When mounting or assembling the optical parts in the optical unit, the parts must be mounted in the specified location and direction as shown in figure below.

No.	Parts Name
1	Dichroic mirror (B)
2	Dichroic mirror (G)
3	Condenser lens (G)
4	Relay lens (IN)
5	Mirror (R)
6	Condenser lens (R)
7	Condenser lens (B)
8	Mirror (B)

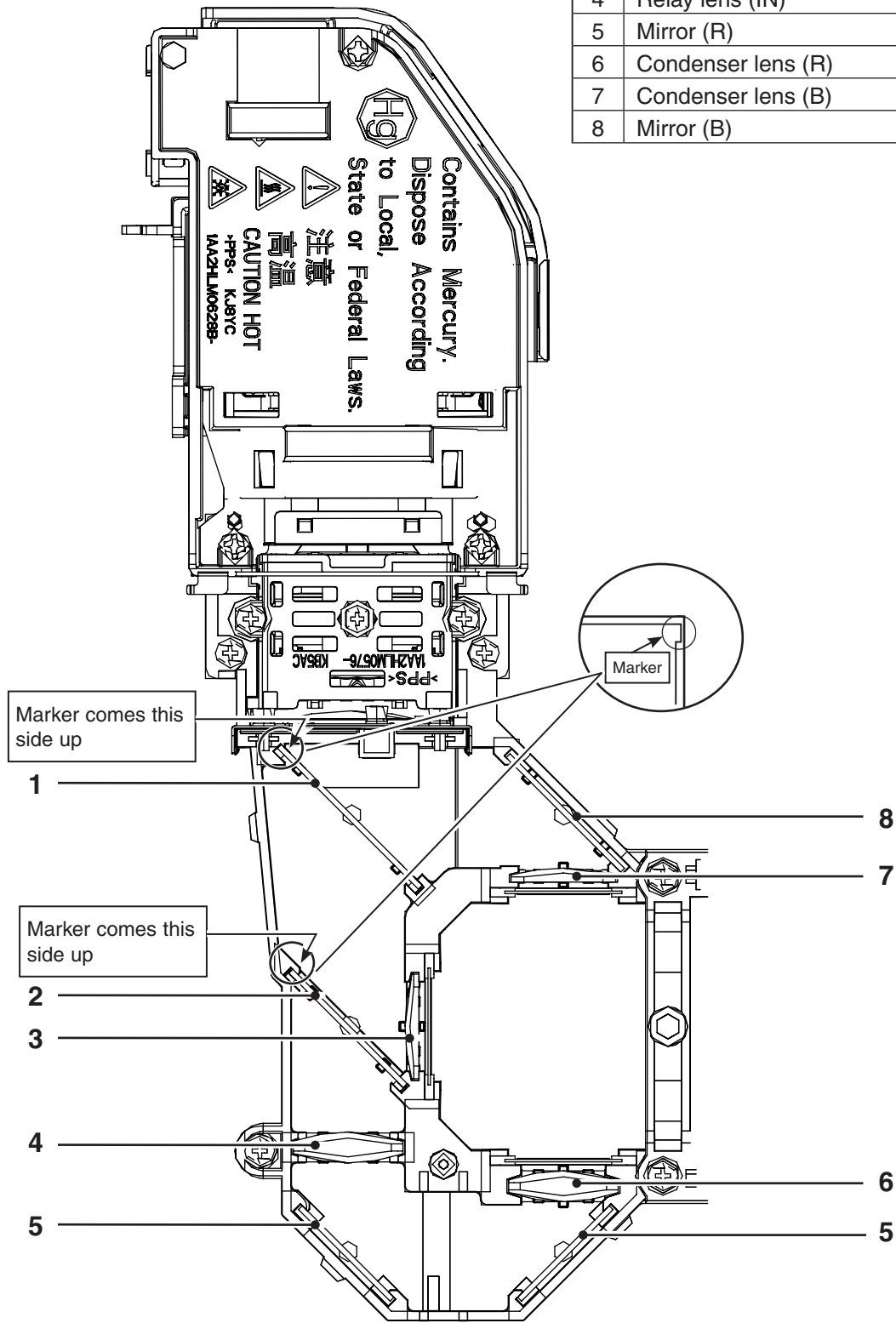


Fig.8

Servicing Notice

Note on main board replacement

Take the following steps when the main board is replaced.

Adjustment data setting

This projector stores "Color shading correction data" in the memory IC (IC801) on the main board. This adjustment data has been setup according to the optical characteristics of the mounted LCD panels precisely in the factory. When replacing the main board, you need to read out those setting datas stored in the memory IC on the previous main board and write down them into the memory IC on the new main board. By this way, it enables the projector to reproduce the picture which has properly adjusted color shading. For further details, refer to the operation manual of the software [PROJECTOR SERVICE TOOL v4.20].

Serial number and lamp runtime setting

The data of serial number is stored in both memory ICs (IC1371) and (IC1051) on the main board. "Serial number" used for the on-screen menu and "lamp runtime" is stored in the memory IC (IC1371). The serial number for EDID is stored in the memory IC (IC1051).

After replacing the main board, perform the work below to restore the serial number and lamp runtime.

- Use the serial no. setting tool to write the correct serial no. referring to the serial no. (S/N) printed on the rating label. For further details, refer to the operation manual of the software [SERIAL NO. SETTING TOOL v1.00].
- It is impossible to rewrite the serial number stored in the memory IC (IC1051), remove it on the previous main board and replace it on the new main board.
- It is impossible to rewrite the lamp runtime stored in the memory IC (IC1371), remove it on the previous main board and replace it on the new main board.

The projector service tool v.4.20 and serial no. setting tool v1.00 can be download from the projector service web site.

Model no. setting

The data of projector's model no. is stored in both memory ICs (IC1371) and (IC1051) on the main board. The model number displayed on on-screen menu is stored in the memory IC (IC1371). The model number for EDID is stored in the memory IC (IC1051). After replacing the main board, perform the work below to restore the model number.

1. Enter the service mode.
 2. Select the Group "430 ~ 438" and No. "1", change the data value from "0" to "10". Refer to table below. The data value will return to "0" after setting.
 3. To check the setting, select each Group and No. "0" and check its value with table below.
- How to enter the service mode, or set the Group. No. and data, refer to the item "Service adjustment menu operation".
- It is impossible to rewrite the model number stored in the memory IC (IC1051), remove it on the previous main board and replace it on the new main board.

Model no. setting

Model no. setting	Group	No.	Data
Not defined	430	0	※ (refer t table right)
		1	0 -> 10
PT-TW230 PT-TW231R	431	0	※ (refer t table right)
		1	0 -> 10
PT-TW230U PT-TW231RU	432	0	※ (refer t table right)
		1	0 -> 10
PT-TW230E PT-TW231RE	433	0	※ (refer t table right)
		1	0 -> 10
PT-TW230EJ PT-TW231REJ	434	0	※ (refer t table right)
		1	0 -> 10
PT-TW230EA PT-TW231REA	435	0	※ (refer t table right)
		1	0 -> 10
PT-TW230EAJ PT-TW231REAJ	436	0	※ (refer t table right)
		1	0 -> 10
PT-XW23ST PT-XW25SR	437	0	※ (refer t table right)
		1	0 -> 10

Model no. checking

Data	Model no.
0	Not defined
1	PT-TW230 PT-TW231R
2	PT-TW230U PT-TW231RU
3	PT-TW230E PT-TW231RE
4	PT-TW230EJ PT-TW231REJ
5	PT-TW230EA PT-TW231REA
6	PT-TW230EAJ PT-TW231REAJ
7	PT-XW23ST PT-XW25SR

Adjustments

Adjustments after parts replacement

● : Adjustment necessary ○ : Check necessary

		Disassembly / Replaced parts									
		LCD/ prism assy	Condenser lens (OUT)	Relay lens (OUT)	Polarized glass			Power board			Main board
					R	G	B				
Optical adjustments	Optical center adjustment				●	●	●				
	Condenser lens(OUT) adjustment	○	●								
	Relay lens(OUT) adjustment	○		●							
Electrical Adjustments	Fan voltage adjustment							●	●		
	Panel type check and setting	○							●		
	Auto calibration adjustment [PC]								○		
	Auto calibration adjustment [Component]								○		
	Auto calibration adjustment [Video]								○		
	Common center adjustment	●							●		
	50% white adjustment [PC]	●							●		
	Gamma correction adjustment	○							○		
	White balance adjustment [PC]	○			○	○	○		○		
	Color shading correction adjustment *	○			○	○	○		○		

* To setup or adjust those items, the Projector Service Tool v. 4.20 software is needed. Refer to the owner's manual for this software for the further details.

Optical Adjustments

Before taking optical adjustments below, remove the AV panel and cabinet top following to the “Mechanical Disassembly”.

Adjustments require a 2.0mm hex wrench and a slot screwdriver. When you adjust condenser lens or relay lens adjustment, you need to disconnect FPC cables of LCD panels on the main board.



WARNING : USE UV RADIATION EYE AND SKIN PROTECTION DURING SERVICING



CAUTION: To prevent suffer of UV radiation, those adjustment must be completed within 25 minutes.

Contrast adjustment

[Before adjustment]

- Input a 100% of black raster signal.

- 1 Loosen 1 screw **A** (**Fig.1**) on the polarized glass mounting base which you intend to adjust.
- 2 Adjust the slot **B** to obtain the darkest brightness on the screen by using a slot screwdriver.
- 3 Tighten the screw **A** to fix the polarized glass mounting base.

Repeat steps 1 to 3 for remaining polarized glasses.

- This adjustment should be taken in order of G-panel, R-panel and B-panel.
- This adjustment should be taken in the darkest room to adjust precisely.

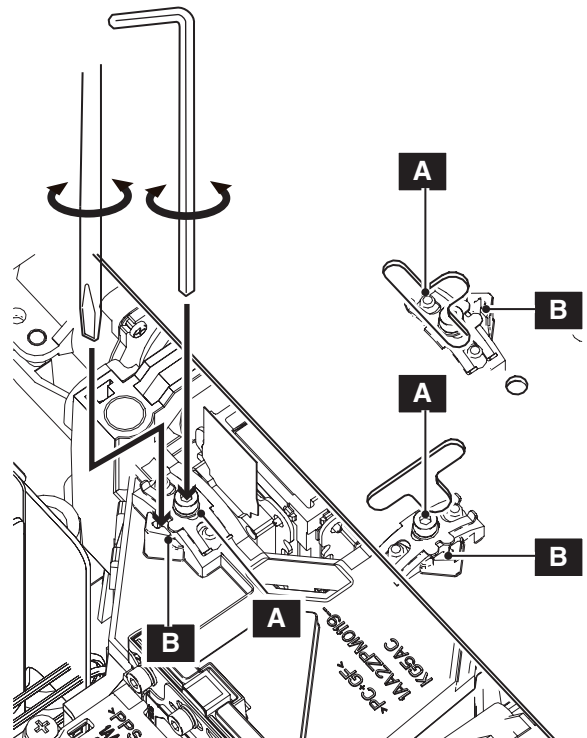
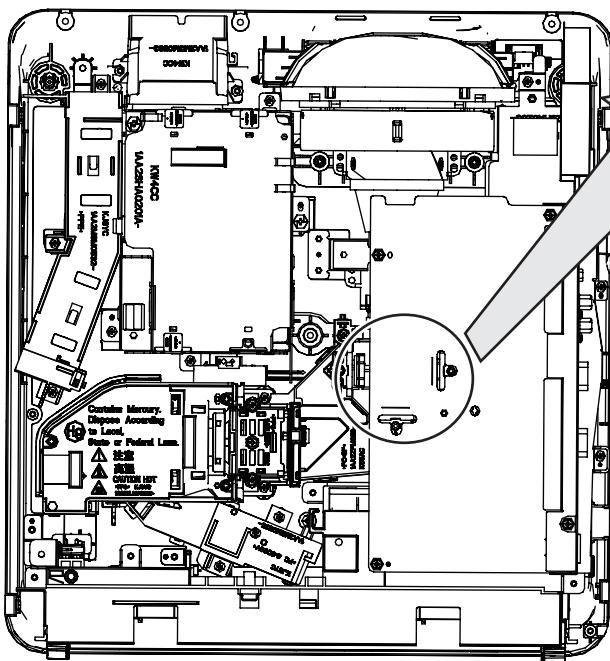


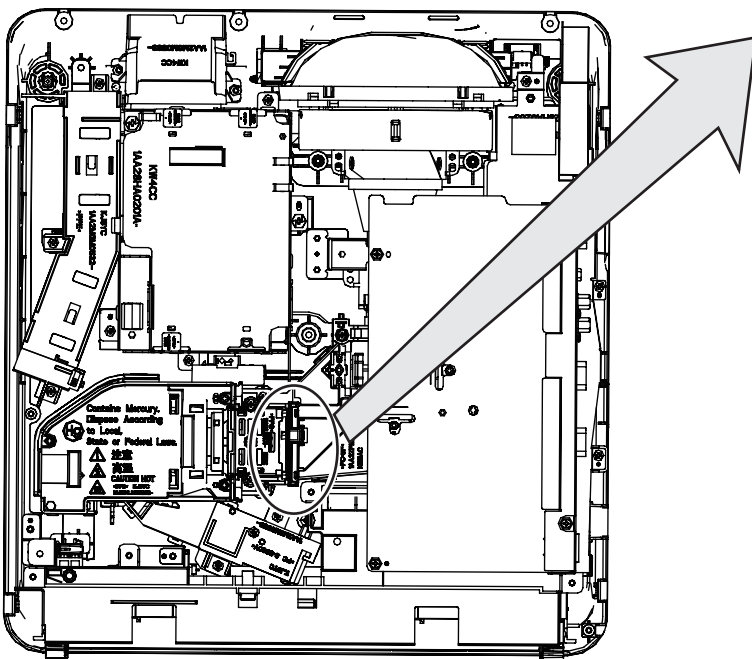
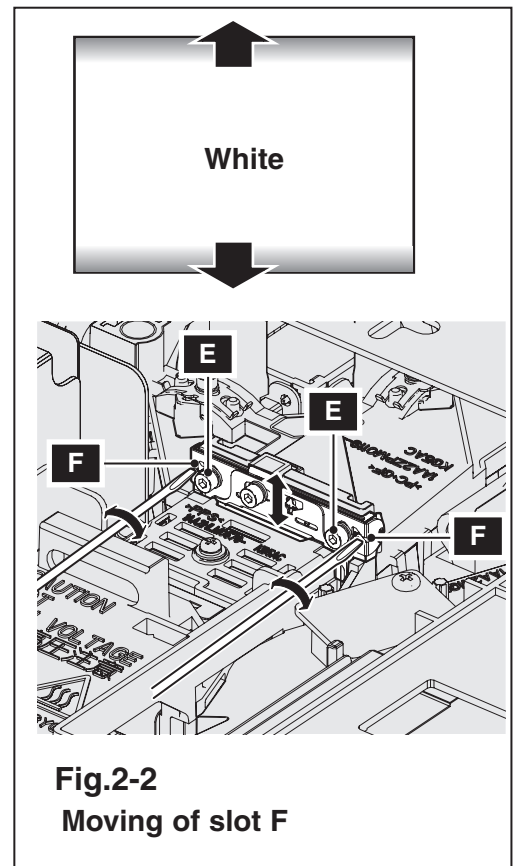
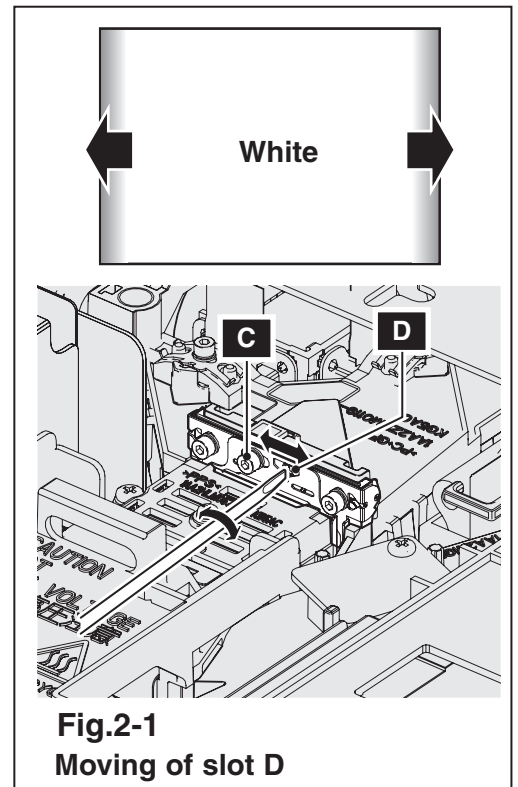
Fig.1

Condenser lens (OUT) adjustment

- 1 Turn the projector on by a state of without FPC cables.
- 2 Project all of lights on the screen.
- 3 Adjust the adjustment base of condenser lens (OUT) assy to make color uniformity in white.
 - 1) If the shading appears on the left or right of the screen as shown in **Fig.2-1**, loosen 1 screw **C**, and adjust the slot **D** to make color uniformity in white by using a slot screwdriver.
 - 2) If the shading appears on the top or bottom of the screen as shown in **Fig.2-2**, loosen 2 screws **E**, and adjust the slots **F** to make color uniformity in white by using a slot screwdriver.
- 4 Tighten screws **C** and **E** to fix the condenser lens (OUT) assy.

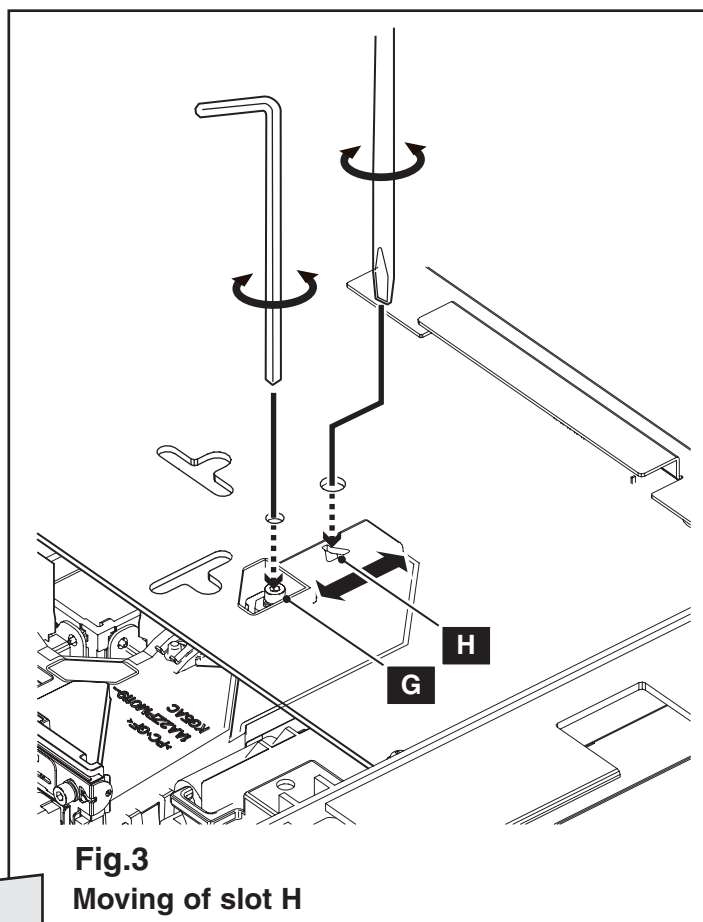
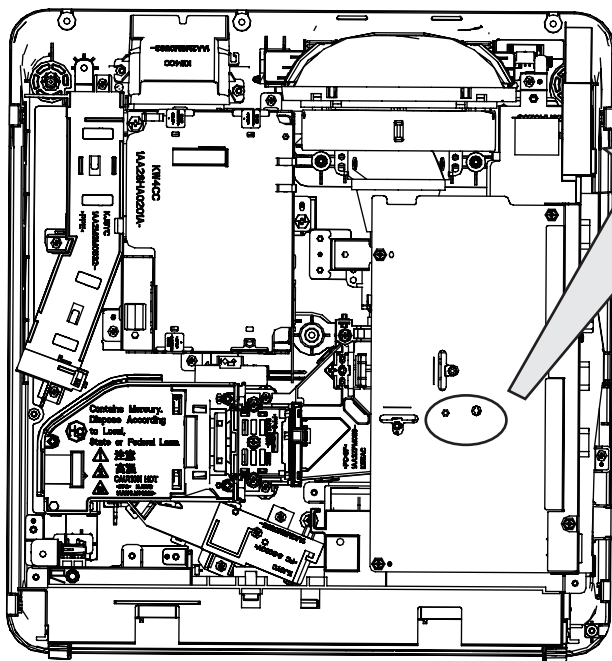
Note:

The relay lens adjustment must be carried out after completing this adjustment.



Relay lens (OUT) adjustment

- 1 Turn the projector on by a state of without FPC cables.
- 2 Project all of lights on the screen.
- 3 Adjust the adjustment base of relay lens (OUT) assy to make color uniformity in white.
If the shading appears on the left or right of the screen as shown in **Fig.3**, loosen 1 screw **G** by using a hex screwdriver, and adjust the slot **H** to make color uniformity in white by using a slot screwdriver.
- 4 Tighten the screw **G** to fix the relay lens (OUT) assy.



Electrical Adjustments

Service adjustment menu operation

To enter the service mode

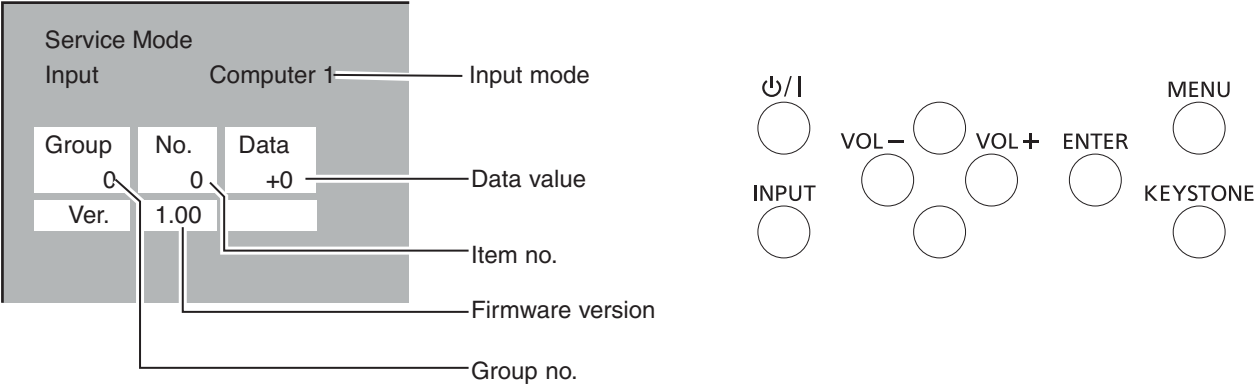
To enter the “Service mode”, press and hold the **MENU button** and **ENTER button** on the projector for more than 3 seconds or press and hold the **MENU button** on the remote control for more than 20 seconds. The service menu appears on the screen as follows.

To adjust service data

Select the adjustment group no. by pressing the **MENU button** (increase) or **ENTER button** (decrease), and select the adjustment item no. by pressing the pointer **▲** or **▼ button**, and change the data value by pressing the **◀** or **▶ button**. Refer to the “Service adjustment data table” for further description of adjustment group no., item no. and data value.

To exit the service mode

To exit the service mode, press the **⏻/| button**.




Circuit adjustments

CAUTION: The each circuit has been made by the fine adjustment at factory. Do not attempt to adjust the following adjustments except requiring the readjustments in servicing otherwise it may cause loss of performance and product safety. Before adjustment, please turn on the projector for more than ten minutes.



WARNING : USE UV RADIATION EYE AND SKIN PROTECTION DURING SERVICING.

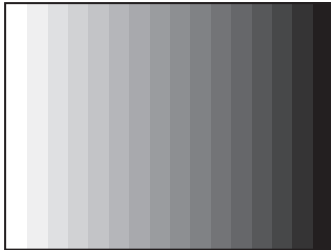


CAUTION:
To prevent suffer of UV radiation, those adjustments must be completed within 25 minutes.

[Adjustment Condition]

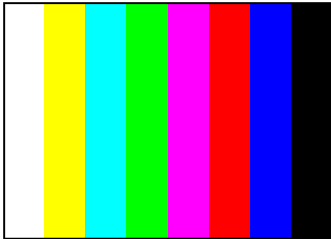
- Input signal
Computer signal.....0.7Vp-p/75Ω terminated (XGA)
Video signal1.0Vp-p/75Ω terminated (Composite video signal)
Component video signal 1.0Vp-p/75Ω terminated (Component video signal) (480i)

16 steps gray scale pattern



White 100% White 0%

8 color 100% full color bar



W Y C G M R B BK
White 100% White 0%

- Image modeStandard
- Lamp powerNormal

Note:
* Please refer to "Service adjustment menu operation" for entering the service mode and adjusting the service data.

1. Fan voltage adjustment

Equipment Digital voltmeter

1. Enter the service mode.
2. Adjust the voltage on each test point by changing the data values of Group-No.

Group - No.	Test Points	Adjustment value
250 - 0	K6W-4	4.5±0.1Vdc
250 - 1	K6W-4	13.5±0.1Vdc
250 - 2	K6W-3	5.0±0.1Vdc
250 - 3	K6W-3	13.5±0.1Vdc
250 - 4	K6W-2	5.0±0.1Vdc
250 - 5	K6W-2	13.5±0.1Vdc

2. Panel type check and setting

* Before setting, you need to check which type of LCD panel is placed on the projector according to the item "LCD panel/prism assy removal" in the chapter "Optical Parts Disassembly".

1. Enter the service mode.
2. Panel Type Check
Select Group "**290**", No. "**0**". Check the data value as follows;
Data value "**0**" : For L-Type of LCD Panel
Data value "**20**" : For R-Type of LCD panel
If the mounted LCD panel type and set Panel mode are differ, take the step below.

3. Panel Type Mode Setting
Select Group "**290**", No. "**1**" and change the data value from 10 to 0 or 20 depending on your LCD panel type. When the data value reaches 0 or 20, it returns to 10 quickly. The gamma-characteristics changes according to your selection.

Adjustments item no. [3] and [5] are carried out at the spare parts shipment in the factory, therefore they are not required when the main board is replaced with new one.

3. Auto calibration adjustment [PC]

Input mode Computer 1 (RGB)
Input signal XGA Computer signal
Signal pattern 16-step gray scale

1. Enter the service mode.
2. Select Group "**260**", No. "**0**" and set the data value to "**1**".
The projector begins auto-calibration and then "**OK**" will appear on the screen.

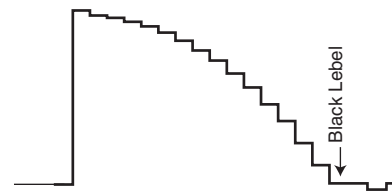
Below adjustments are performed when the above auto calibration is failed.

Pedestal adjustment [PC]

Equipment Oscilloscope

1. Enter the service mode.
2. Adjust the black level on each test point to be minimum by changing the data value of Group - No.

Group - No.	Test Points
0 - 0	TP35G
0 - 1	TP35R
0 - 2	TP35B

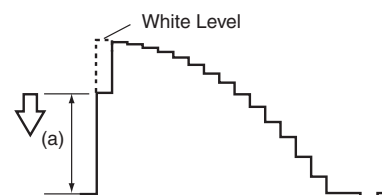


Gain adjustment [PC]

Equipment Oscilloscope

1. Enter the service mode.
2. Adjust the amplitude "**a**" of waveform at each test point to be minimum by changing the data value of Group - No.

Group - No.	Test Points
0 - 3	TP35G
0 - 4	TP35R
0 - 5	TP35B



4. Auto calibration adjustment [Component]

Input mode	Computer 1 (Component)
Input signal	480i component signal
Signal pattern	8 color bar

1. Enter the service mode
2. Select Group "**260**", No. "**0**" and then change data value from "**0**" to "**1**". After the auto-calibration completed, "**OK**" will appear on the screen.

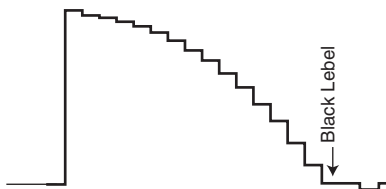
Below adjustments are performed when the above auto calibration is failed.

Pedestal adjustment [Component]

Input signal	480i component signal
Signal pattern	16-step gray scale
Equipment	Oscilloscope

1. Enter the service mode.
2. Adjust the black level on each test point to be minimum by changing the data value of Group - No.

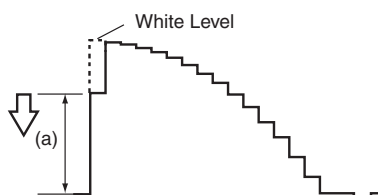
Group - No.	Test Points
0 - 0	TP35G
0 - 1	TP35R
0 - 2	TP35B



Gain adjustment [Component]

1. Enter the service mode.
2. Adjust the amplitude "**a**" of waveform at each test point to be minimum by changing the data value of Group - No.

Group - No.	Test Points
0 - 3	TP35G



5. Auto calibration adjustment [Video]

Input mode	Video
Input signal	Composite video signal
Signal pattern	16-step gray scale

1. Enter the service mode.
2. Select Group "**260**", No. "**0**" and then change data value from "**0**" to "**1**". After the auto-calibration completed, "**OK**" will appear on the screen.

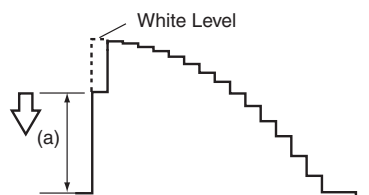
Below adjustment is performed when the above auto calibration is failed.

Gain adjustment [Video]

Equipment	Oscilloscope
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1. Enter the service mode.
2. Adjust the amplitude "**a**" of waveform at each test point to be minimum by changing the data value of Group - No.

Group - No.	Test Points
20 - 0	TP35G



6. Common center adjustment

Input mode	Computer 1 (RGB)
Input signal	XGA computer signal
Signal patterns	50% R, G, B whole signals

1. Enter the service mode
2. Select Group "**100**", No. "**92**" and change the data value from "**0**" to "**2**" to reduce the panel frequency.
3. Change data value to obtain the minimum flicker for each color on the screen.

Group - No.	Adjustment
101 - 1	for green flicker
101 - 0	for red flicker
101 - 2	for blue flicker

4. Select Group "**100**", No. "**92**" and change the data value from "**2**" to "**0**" to reset the panel frequency.

7. 50% white adjustment [PC]

Equipment	Illuminance meter
Input mode	Computer1 (RGB)
Input signal	XGA computer signal
Input patterns	100%-white and 50%-gray signals

1. Enter the service mode.
2. Input the 100%-white computer signal and measure illuminance on the screen with the illuminance meter. It is **A** for the reading of illuminance meter.
3. Change the signal source to the 50%-white computer signal.
4. Select Group "**100**", No. "**6**" and change the data value to make the reading of illuminance meter to be **A x 22%**.

8. White balance adjustment [PC]

Input mode	Computer 1 (RGB)
Input signal	XGA computer signal
Signal patterns	16-step gray signals

1. Enter the service mode.
2. Select Group "**100**", No. "**7**" (Red) or "**8**" (Blue), and change Data values respectively to make a proper white balance.

Group - No.	Adjustment
101 - 7	Color balance Red
101 - 8	Color balance Blue

9. Gamma correction adjustment

Software	PROJECTOR SERVICE TOOL v4.20
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Use the software to obtain the proper gray scale of the screen. See the further information of the software instruction manual.

10. Color shading correction adjustment

Software	PROJECTOR SERVICE TOOL v4.20
Signal pattern	6%, 13%, 25%, 50% whole gray

Use the software to correct the color shading of the screen. See the further information of the software instruction manual.

The color shading correction adjustment for this model should be performed with the whole-gray patterns specified as above.

Corresponding to the pull-down menu of the gray level selector on the software.

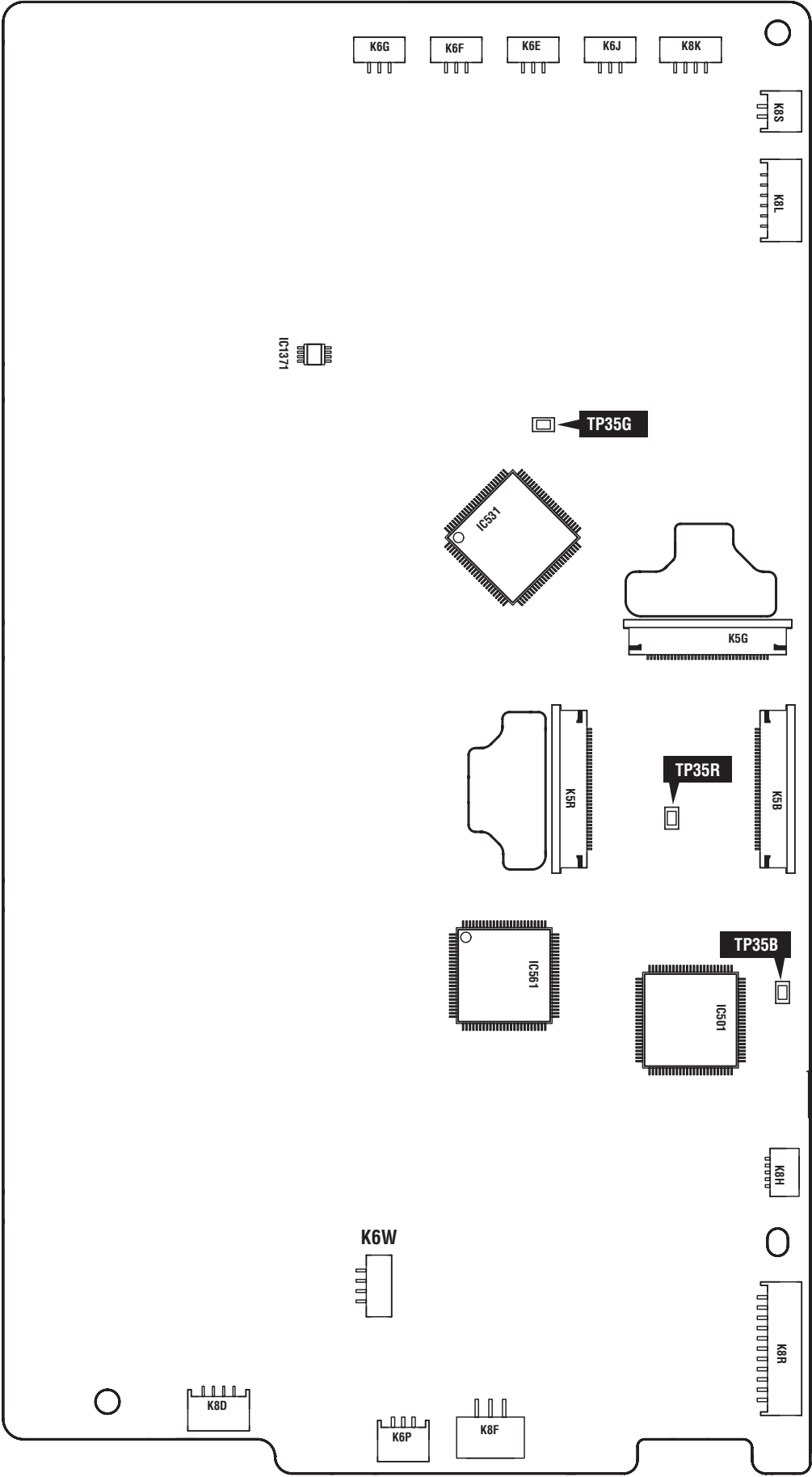
Level 0	:6%
Level 384	:13%
Level 640	:25%
Level 1032	:50%

Relation of level (%) indication and signal pattern

0%	:Black
100%	:White

Test points and locations

MAIN BOARD



Service adjustment data

The adjustment items indicated with “*” are required to readjust following to the “Electrical adjustments”. Other items should be used with the initial data value.

Group/ Item	Item Name	Function	Initial	Range	Note
Group 0	AD Converter (PW190)				
0	ADC G-OFFSET	PC / Component SCART	128/120/128	0 - 255	
1	ADC R-OFFSET	PC / Component SCART	128/140/128	0 - 255	
2	ADC B-OFFSET	PC / Component SCART	128/140/128	0 - 255	
3	ADC G-GAIN	PC / Component SCART	50/50/50	0 - 255	
4	ADC R-GAIN	PC / Component SCART	40/40/40	0 - 255	
5	ADC B-GAIN	PC / Component SCART	40/40/40	0 - 255	
6	GRAAFLTR/RBAAFLTR	Green (Red and Blue) Anti-Alias Filter	4 / R / R	0 - 7	Composite & S-Video / Component / PC *R: Read only value
7	GRNAADWNSMPL / RBAAADWNSMPL	Green (Red and Blue) Anti-Alias Downsample	0 / R / R	0 - 3	
8	GRNAAHF / RBAAHF	Green (Red and Blue) Anti-Alias High Frequency	3 / R / R	0 - 3	
10	SOGTH	PC / Component SCART Sync On Green Threshold	6/4/4	0 - 15	
11	SOGHYSDIS	PC / Component SCART Sync On Green Hysteresis Enable	0	0 - 1	
12	HS1TH		4	0 - 7	
13	HS0TH		4	0 - 7	
100	PreCoast PC Signal		3	0 - 63	
101	PostCoast PC Signal		8	0 - 63	
120	PreCoast PC Video 480i		7	0 - 63	
121	PostCoast PC Video 480i		13	0 - 63	
122	PreCoast PC Video 575i		7	0 - 63	
123	PostCoast PC Video 575i		13	0 - 63	
124	PreCoast PC Video 480p		7	0 - 63	
125	PostCoast PC Video 480p		13	0 - 63	
126	PreCoast PC Video 575p		7	0 - 63	
127	PostCoast PC Video 575p		13	0 - 63	
128	PreCoast PC Video 720p 60Hz		7	0 - 63	
129	PostCoast PC Video 720p 60Hz		13	0 - 63	
130	PreCoast PC Video 720p 50Hz		7	0 - 63	
131	PostCoast PC Video 720p 50Hz		13	0 - 63	
132	PreCoast PC Video 1080i 60Hz		7	0 - 63	
133	PostCoast PC Video 1080i 60Hz		13	0 - 63	
134	PreCoast PC Video 1080i 50Hz		7	0 - 63	
135	PostCoast PC Video 1080i 50Hz		13	0 - 63	
136	PreCoast PC Video 1035i		7	0 - 63	
137	PostCoast PC Video 1035i		13	0 - 63	
138	PreCoast PC Video 1080p 60Hz		7	0 - 63	
139	PostCoast PC Video 1080p 60Hz		13	0 - 63	
140	PreCoast PC Video 1080p 50Hz		7	0 - 63	
141	PostCoast PC Video 1080p 50Hz		13	0 - 63	
142	PreCoast PC Video 1080p 30Hz		7	0 - 63	
143	PostCoast PC Video 1080p 30Hz		13	0 - 63	
144	PreCoast PC Video 1080p 25Hz		7	0 - 63	
145	PostCoast PC Video 1080p 25Hz		13	0 - 63	
146	PreCoast PC Video 1080p 24Hz		7	0 - 63	

Electrical Adjustments

Group/Item	Item Name	Function	Initial	Range	Note
147	PostCoast PCVideo1080p 24Hz		13	0 - 63	
150	PreCoast YCbCr 480i		7	0 - 63	
151	PostCoast YCbCr 480i		13	0 - 63	
152	PreCoast YCbCr 575i		7	0 - 63	
153	PostCoast YCbCr 575i		13	0 - 63	
154	PreCoast YCbCr 480p		7	0 - 63	
155	PostCoast YCbCr 480p		13	0 - 63	
156	PreCoast YCbCr 575p		7	0 - 63	
157	PostCoast YCbCr 575p		13	0 - 63	
158	PreCoast YCbCr 720p 60Hz		7	0 - 63	
159	PostCoast YCbCr 720p 60Hz		13	0 - 63	
160	PreCoast YCbCr 720p 50Hz		7	0 - 63	
161	PostCoast YCbCr 720p 50Hz		13	0 - 63	
162	PreCoast YCbCr 1080i 60Hz		7	0 - 63	
163	PostCoast YCbCr 1080i 60Hz		13	0 - 63	
164	PreCoast YCbCr 1080i 50Hz		7	0 - 63	
165	PostCoast YCbCr 1080i 50Hz		13	0 - 63	
166	PreCoast YCbCr 1035i		7	0 - 63	
167	PostCoast YCbCr 1035i		13	0 - 63	
180	PreCoast SCART 480i		7	0 - 63	
181	PostCoast SCART 480i		13	0 - 63	
182	PreCoast SCART 575i		7	0 - 63	
183	PostCoast SCART 575i		13	0 - 63	

Group 10	Sync Processor				
0	SYNCAMPHL CKTOLW	Minimum sync amplitude threshold for HLCK 1 to 0 transition	0x700	0 - 9999	
1	SYNCAMPHLCKTOHI	Minimum sync amplitude threshold for HLCK 0 to 1 transition	0x1000	0 - 9999	

Group 20	Video Decoder				
0	Y Level	Composite / S-Video - Y Level (ADC RGB Gain)	10 / 10	0 - 255	Composite / S-Video
1	C Level	Composite / S-Video - C Level (ADC Saturation)	115 / 115	0 - 255	Composite / S-Video
3	XCXL Level	Cross-Chroma, Cross-Luma Level	3	0 - 5	
4	C2DNBANDWIDTH	Comb 2D Narrow Bandwidth	3 / 3	0 - 3	NTSC/PAL
5	C2DWBANDWIDTH	Comb 2D WidBandwidth	4 / 4	0 - 7	NTSC/PAL
6	C2DCNMINLEAK	Comb 2D ChromNarrow Band Minimum Leakage	0 / 3	0 - 3	NTSC/PAL
7	C2DCNSLOPELEAK	Comb 2D Narrow Band Slope Leakage	7 / 7	0 - 7	NTSC/PAL
8	C2DCWMINLEAK	Comb 2D Wide Band Minimum Leakage	1 / 3	0 - 3	NTSC/PAL
9	C2DCWSLOPELEAK	Comb 2D CW Slope Leakage	6 / 6	0 - 7	NTSC/PAL
10	COMBLEAK2BPGAIN	Comb Leak To Ban Pass Gain	1 / 0	0 - 3	NTSC/PAL
11	C2DBDIAGONALGAIN	Comb 2D Band Pass Diagonal Gain	1 / 3	0 - 3	NTSC/PAL
12	C2DNBCWBCLGAIN	Comb 2D Narrow Band Comb Wide Band Comb	1 / 1	0 - 3	NTSC/PAL
13	RLUMASETUP-Enable	7.5IRE Setup Enable	0	0 - 1	Effective only NTSC Signal

Group 40	General				
0	IP Mode	0: IP Block not used 1: IP OFF used with IP Block	1	0 - 1	
1	3:2 PullDown Mode	bit0 : Global Motion bit1 : Video Motion	1	1 - 3	
2	Detect Film Mode Enable	0 : 2:3pull down & 2:2pull down 1 : 2:3pull down 2 : 2:2pull down	0	0 - 2	
3	Force IP Mode	0 : IP Process Disable 1 : Force Normal IP Mode 2 : Force Film Mode Effective only for PSF Signal.	2	0 - 2	

Electrical Adjustments

Group/Item	Item Name	Function	Initial	Range	Note
Group 41	Deinterlacer setting Effective only for Progressive ON-L1 mode.				
0	Motion Adaptive Weight Value	<KDEINT>	30	0 - 255	
1	Angle Interpolation Level	0 : Conservative <====> 4 : Aggressive	4	0 - 4	
2	CUE Low Pass Filter Enable	<CUELPFEN>	0	0 - 1	
Group 42	Deinterlacer setting Effective only for Progressive ON-L2 mode.				
0	Motion Adaptive Weight Value	<KDEINT>	0	0 - 255	
1	Angle Interpolation Level	0 : Conservative <====> 4 : Aggressive	2	0 - 4	
2	CUE Low Pass Filter Enable	<CUELPFEN>	0	0 - 1	
Group 43	Deinterlacer setting Effective only for Progressive ON/Film mode.				
0	Motion Adaptive Weight Value	<KDEINT>	30	0 - 255	
1	Angle Interpolation Level	0 : Conservative <====> 4 : Aggressive	4	0 - 4	
2	CUE Low Pass Filter Enable	<CUELPFEN>	0	0 - 1	
Group 45	Noise Reduction (Time) Effective only for N.R - Off				
0	Noise Pixel Range	<NSRANGEY> / <NSRANGEUV>	1	0 - 2	
1	Noise Region 0	<NSREGIONY0> / <NSREGIONUV0>	12	0 - 1023	
2	Noise Region 1	<NSREGIONY1> / <NSREGIONUV1>	24	0 - 1023	
3	Noise Region 2	<NSREGIONY2> / <NSREGIONUV2>	40	0 - 1023	
4	Noise Gain Level	<NSFILTERY**> / <NSFILTERUV**>	0	0 - 255	
Group 47	Noise Reduction (Time) Effective only for N.R L1				
0	Noise Pixel Range	<NSRANGEY> / <NSRANGEUV>	1	0 - 2	
1	Noise Region 0	<NSREGIONY0> / <NSREGIONUV0>	12	0 - 1023	
2	Noise Region 1	<NSREGIONY1> / <NSREGIONUV1>	24	0 - 1023	
3	Noise Region 2	<NSREGIONY2> / <NSREGIONUV2>	40	0 - 1023	
4	Noise Gain Level	<NSFILTERY**> / <NSFILTERUV**>	50	0 - 255	
Group 49	Noise Reduction (Time) Effective only for N.R L2				
0	Noise Pixel Range	<NSRANGEY> / <NSRANGEUV>	1	0 - 2	
1	Noise Region 0	<NSREGIONY0> / <NSREGIONUV0>	12	0 - 1023	
2	Noise Region 1	<NSREGIONY1> / <NSREGIONUV1>	24	0 - 1023	
3	Noise Region 2	<NSREGIONY2> / <NSREGIONUV2>	40	0 - 1023	
4	Noise Gain Level	<NSFILTERY**> / <NSFILTERUV**>	100	0 - 255	
Group 50	2:2pull down setting				
0	22Film Mode Sensitivity	Film Detection Sensitivity <FILMSTVT22>	4	1 - 5	
1	22Film Mode Threshold Low	<FILMTHRD22A>	80	0 - 32767	
2	22Film Mode Threshold High	<FILMTHRD22B>	120	0 - 32767	
3	VOFTHR13	<VOFTHR13>	124	0 - 1023	Read only value
4	VOFTHR12	<VOFTHR12>	124	0 - 1023	Read only value
5	VOFTHR23	<VOFTHR23>	124	0 - 1023	Read only value
6	Video Motion Window Start X	<VOFSTARX>	10	0 - 2047	Range of detective for Film mode
7	Video Motion Window Stop X	<VOFSTOPX>	10	0 - 2047	Range of detective for Film mode

Electrical Adjustments

Group/Item	Item Name	Function	Initial	Range	Note
8	Video Motion Window Start Y	<VOFSTARY>	10	0 - 1023	Range of detective for Film mode
9	Video Motion Window Stop Y	<VOFSTOPY>	10	0 - 1023	Range of detective for Film mode
Group 51	2:3pull down setting				
0	Global Motion Sensitivity	Film Detection Sensitivity <FILMSTVT23>	4	1 - 5	
1	Video Motion Sensitivity	Film Detection Sensitivity <VOFSTVT>	4	1 - 5	
2	Video Motion Threshold Low	<VOFTHRDA>	120	0 - 32767	
3	Video Motion Threshold High	<VOFTHRDB>	180	0 - 32767	
4	Global Motion Threshold	<GMDTHRD>	124	0 - 1023	Read only value
5	23Film Mode Threshold	<FILMTHRD23>	100	0 - 32767	
6	Global Motion Window Start X	<GMDSTARX>	10	0 - 2047	Range of detective for Film mode
7	Global Motion Window Stop X	<GMDSTOPX>	10	0 - 2047	Range of detective for Film mode
8	Global Motion Window Start Y	<GMDSTARY>	10	0 - 1023	Range of detective for Film mode
9	Global Motion Window Stop Y	<GMDSTOPY>	10	0 - 1023	Range of detective for Film mode
Group 60	Image				
0	Center Contrast	512/556/534/534/492/492	0 - 1023	Video(S-Video) / Component / SCART /ANALOG / DIGITAL / HDCP Setting Value=(MENU Value - MENU Center Value) x Alpha / 10 + Center [Setting Value to PW] Contrast [Max] 1023 [Min] 0 Brightness [Max] 1023 [Min] 0 Color [Max] 1023 [Min] 0 Tint [Max] 180 [Min] 0 Sharpness [Max] 57 [Min] 0	
1	Center Brightness	512/480/512/500/512/512	0 - 1023		
2	Center Color	512/534/512/512/512/512	0 - 1023		
3	Center Tint	90/90/90/90/90/90	0-180		
4	Center Sharpness	16/16/16/16/16/16	16		
5	Alpha Contrast	40/40/40/40/40/40	0-1000		
6	Alpha Brightness	140/140/140/140/140/140	0-1000		
7	Alpha Color	70/70/70/70/70/70	0-1000		
8	Alpha Tint	10/10/10/10/10/10	0-1000		
9	Alpha Sharpness	10/10/10/10/10/10	0-1000		
Group 100	Panel Service				
0	G-SubGain	2048/2068/2024/2024/1950/1950/1830/1900/2048/2068/2024/2024/1950/1950/1830/1900	0-4095	PCStandard/PCDynamic/PCReal/PCBlackBoard/PCColBoaR/PCColBoaG/PCColBoaB/PCColBoaY/ AVStandard/AVDynamic/AVCinema/AVBlackBoard/AVColBoaR/AVColBoaG/AVColBoaB/AVColBoaY/	
1	R-SubGain	2048/2068/2024/2024/1850/2048/1950/2048/2048/2068/2024/2024/1850/2048/1950/2048	0-4095		
2	B-SubGain	2048/2068/2024/2024/2048/2000/2048/2048/2068/2024/2024/2048/2000/2048/2048	0-4095		
3	G-SubBright	0/0/32/32/0/0/0/0/0/32/32/0/0/0/0/0	0-4095	PCStandard/PCDynamic/PCReal/PCBlackBoard/PCColBoaR/PCColBoaG/PCColBoaB/PCColBoaY/ AVStandard/AVDynamic/AVCinema/AVBlackBoard/AVColBoaR/AVColBoaG/AVColBoaB/AVColBoaY/	
4	R-SubBright	0/0/32/40/0/32/0/32/0/0/32/40/0/32/0/32	0-4095		
5	B-SubBright	0/0/32/32/16/0/40/32/0/0/32/32/16/0/40/32	0-4095		
6	G-GammaShift	0/0	0-4095	PC/AV Center=512 [R] and [B] are linked with [G]	
7	R-GammaShift	0/0	0-4095		
8	B-GammaShift	0/0	0-4095		
9	G-ReferH	4095/4095	0-4095		
10	G-ReferL	788/788	0-4095		
11	R-ReferH	4095/4095	0-4095		
12	R-ReferL	788/788	0-4095		
13	B-ReferH	4095/4095	0-4095		
14	B-ReferL	788/788	0-4095		
15	DXOutR	266	0-1023		
16	DXOutG	266	0-1023		
17	DXOutB	266	0-1023		
18	H_Change_Pos	36	0-255		
19	SH_Base	273	0-4095		

Electrical Adjustments

Group/ Item	Item Name	Function	Initial	Range	Note
20	NRG_Pos		41	0-127	
21	NRG_Width		51	0-255	
22	OSD_Pos		2	0-3	
23	OSD_Ptn		0	0-9	
24	GammaCtrl		1	0-1	
25	REF_GatePos		7	0-1023	
26	REF_GateDur		194	0-1023	
27	R-BasePos		6	0-15	
28	G-BasePos		6	0-15	
29	B-BasePos		6	0-15	
30	RGB-Adjust		0	0-7	
31	RGB-AdjLv		0	0-4095	Operation STEP=256[0<-->256<-->512<-->768<-->1023]
32	LineR0		0	0-1023	(MIN<-->MAX Cyclic Operation)
33	LineR1		0	0-1023	(MIN<-->MAX Cyclic Operation)
34	LineR2		0	0-1023	(MIN<-->MAX Cyclic Operation)
35	LineR3		0	0-1023	(MIN<-->MAX Cyclic Operation)
36	LineR4		0	0-1023	(MIN<-->MAX Cyclic Operation)
37	LineG0		0	0-1023	(MIN<-->MAX Cyclic Operation)
38	LineG1		0	0-1023	(MIN<-->MAX Cyclic Operation)
39	LineG2		0	0-1023	(MIN<-->MAX Cyclic Operation)
40	LineG3		0	0-1023	(MIN<-->MAX Cyclic Operation)
41	LineG4		0	0-1023	(MIN<-->MAX Cyclic Operation)
42	LineB0		0	0-1023	(MIN<-->MAX Cyclic Operation)
43	LineB1		0	0-1023	(MIN<-->MAX Cyclic Operation)
44	LineB2		0	0-1023	(MIN<-->MAX Cyclic Operation)
45	LineB3		0	0-1023	(MIN<-->MAX Cyclic Operation)
46	LineB4		0	0-1023	(MIN<-->MAX Cyclic Operation)
47	GhostR-Pos		6	0-31	
48	GhostG-Pos		6	0-31	
49	GhostB-Pos		6	0-31	
50	GhostR-Cent		0	0-2047	
51	GhostR-Start		128	0-255	
52	GhostR-End		128	0-255	
53	GhostG-Cent		0	0-2047	
54	GhostG-Start		128	0-255	
55	GhostG-End		128	0-255	
56	GhostB-Cent		0	0-2047	
57	GhostB-Start		128	0-255	
58	GhostB-End		128	0-255	
59	BlockR1		0	0-2047	(MIN<-->MAX Cyclic Operation)
60	BlockG1		0	0-2047	(MIN<-->MAX Cyclic Operation)
61	BlockB1		0	0-2047	(MIN<-->MAX Cyclic Operation)
62	BlockR2		0	0-2047	(MIN<-->MAX Cyclic Operation)
63	BlockG2		0	0-2047	(MIN<-->MAX Cyclic Operation)
64	BlockB2		0	0-2047	(MIN<-->MAX Cyclic Operation)
65	ReverseR		0	0-2047	(MIN<-->MAX Cyclic Operation)
66	ReverseG		0	0-2047	(MIN<-->MAX Cyclic Operation)
67	ReverseB		0	0-2047	(MIN<-->MAX Cyclic Operation)
68	BackCrossR-Cent		1	0-2047	
69	BackCrossR-Start		128	0-255	
70	BackCrossR-End		130	0-255	
71	BackCrossG-Cent		1	0-2047	
72	BackCrossG-Start		128	0-255	
73	BackCrossG-End		130	0-255	
74	BackCrossBR-Cent		1	0-2047	
75	BackCrossB-Start		128	0-255	
76	BackCrossB-End		130	0-255	
77	ColshdSelect		1	0-1	
78	R-Min		305	0-1023	
79	R-Mid2		445	0-1023	
80	R-Mid1		585	0-1023	
81	R-Max		685	0-1023	
82	G-Min		305	0-1023	
83	G-Mid2		445	0-1023	
84	G-Mid1		585	0-1023	
85	G-Max		685	0-1023	
86	B-Min		305	0-1023	
87	B-Mid2		445	0-1023	
88	B-Mid1		585	0-1023	
89	B-Max		685	0-1023	
90	H-OutPos		114	0-2047	
91	OutAreaLv		2048	0-4095	

Electrical Adjustments

Group/ Item	Item Name	Function	Initial	Range	Note
92	FlickerAdj		0	0/2	
93	FRC_Bit		3	0-3	
94	FrontCTalkR-Cent		2046	0-2047	
95	FrontCTalkR-Start		128	0-255	
96	FrontCTalkR-End		128	0-255	
97	FrontCTalkG-Cent		2046	0-2047	
98	FrontCTalkG-Start		128	0-255	
99	FrontCTalkG-End		128	0-255	
100	FrontCTalkB-Cent		2046	0-2047	
101	FrontCTalkB-Start		128	0-255	
102	FrontCTalkB-End		128	0-255	
103	R-DCOffset-NGain		0	0-1023	
104	R-DCOffset-N1		0	0-2047	
105	R-DCOffset-N2		0	0-2047	
106	R-DCOffset-N3		0	0-2047	
107	R-DCOffset-N4		0	0-2047	
108	R-DCOffset-N5		0	0-2047	
109	R-DCOffset-N6		0	0-2047	
110	R-DCOffset-N7		0	0-2047	
111	R-DCOffset-N8		0	0-2047	
112	R-DCOffset-N9		0	0-2047	
113	R-DCOffset-N10		0	0-2047	
114	R-DCOffset-N11		0	0-2047	
115	R-DCOffset-N12		0	0-2047	
116	G-DCOffset-NGain		0	0-1023	
117	G-DCOffset-N1		0	0-2047	
118	G-DCOffset-N2		0	0-2047	
119	G-DCOffset-N3		0	0-2047	
120	G-DCOffset-N4		0	0-2047	
121	G-DCOffset-N5		0	0-2047	
122	G-DCOffset-N6		0	0-2047	
123	G-DCOffset-N7		0	0-2047	
124	G-DCOffset-N8		0	0-2047	
125	G-DCOffset-N9		0	0-2047	
126	G-DCOffset-N10		0	0-2047	
127	G-DCOffset-N11		0	0-2047	
128	G-DCOffset-N12		0	0-2047	
129	B-DCOffset-NGain		0	0-1023	
130	B-DCOffset-N1		0	0-2047	
131	B-DCOffset-N2		0	0-2047	
132	B-DCOffset-N3		0	0-2047	
133	B-DCOffset-N4		0	0-2047	
134	B-DCOffset-N5		0	0-2047	
135	B-DCOffset-N6		0	0-2047	
136	B-DCOffset-N7		0	0-2047	
137	B-DCOffset-N8		0	0-2047	
138	B-DCOffset-N9		0	0-2047	
139	B-DCOffset-N10		0	0-2047	
140	B-DCOffset-N11		0	0-2047	
141	B-DCOffset-N12		0	0-2047	
142	R-DCOffset-PGain		0	0-1023	
143	R-DCOffset-P1		0	0-2047	
144	R-DCOffset-P2		0	0-2047	
145	R-DCOffset-P3		0	0-2047	
146	R-DCOffset-P4		0	0-2047	
147	R-DCOffset-P5		0	0-2047	
148	R-DCOffset-P6		0	0-2047	
149	R-DCOffset-P7		0	0-2047	
150	R-DCOffset-P8		0	0-2047	
151	R-DCOffset-P9		0	0-2047	
152	R-DCOffset-P10		0	0-2047	
153	R-DCOffset-P11		0	0-2047	
154	R-DCOffset-P12		0	0-2047	
155	G-DCOffset-PGain		0	0-1023	
156	G-DCOffset-P1		0	0-2047	
157	G-DCOffset-P2		0	0-2047	
158	G-DCOffset-P3		0	0-2047	
159	G-DCOffset-P4		0	0-2047	
160	G-DCOffset-P5		0	0-2047	
161	G-DCOffset-P6		0	0-2047	
162	G-DCOffset-P7		0	0-2047	
163	G-DCOffset-P8		0	0-2047	
164	G-DCOffset-P9		0	0-2047	

Electrical Adjustments

Group/ Item	Item Name	Function	Initial	Range	Note
165	G-DCOffset-P10		0	0-2047	
166	G-DCOffset-P11		0	0-2047	
167	G-DCOffset-P12		0	0-2047	
168	B-DCOffset-PGain		0	0-1023	
169	B-DCOffset-P1		0	0-2047	
170	B-DCOffset-P2		0	0-2047	
171	B-DCOffset-P3		0	0-2047	
172	B-DCOffset-P4		0	0-2047	
173	B-DCOffset-P5		0	0-2047	
174	B-DCOffset-P6		0	0-2047	
175	B-DCOffset-P7		0	0-2047	
176	B-DCOffset-P8		0	0-2047	
177	B-DCOffset-P9		0	0-2047	
178	B-DCOffset-P10		0	0-2047	
179	B-DCOffset-P11		0	0-2047	
180	B-DCOffset-P12		0	0-2047	
181	ENBX-R		0	0-127	
182	ENBX-G		0	0-127	
183	ENBX-B		0	0-127	
184	DXOutPos		0	0-1	
185	R_V_INPUT_SETP_0		20	0-1023	
186	R_V_INPUT_SETP_512		17	0-1023	
187	R_V_INPUT_SETP_1024		13	0-1023	
188	R_V_INPUT_SETP_1536		9	0-1023	
189	R_V_INPUT_SETP_2048		4	0-1023	
190	R_V_INPUT_SETP_2560		0	0-1023	
191	R_V_INPUT_SETP_3072		1020	0-1023	
192	R_V_INPUT_SETP_3584		1018	0-1023	
193	R_V_INPUT_SETP_4096		1016	0-1023	
194	G_V_INPUT_SETP_0		20	0-1023	
195	G_V_INPUT_SETP_512		17	0-1023	
196	G_V_INPUT_SETP_1024		13	0-1023	
197	G_V_INPUT_SETP_1536		9	0-1023	
198	G_V_INPUT_SETP_2048		4	0-1023	
199	G_V_INPUT_SETP_2560		0	0-1023	
200	G_V_INPUT_SETP_3072		1020	0-1023	
201	G_V_INPUT_SETP_3584		1018	0-1023	
202	G_V_INPUT_SETP_4096		1016	0-1023	
203	B_V_INPUT_SETP_0		20	0-1023	
204	B_V_INPUT_SETP_512		17	0-1023	
205	B_V_INPUT_SETP_1024		13	0-1023	
206	B_V_INPUT_SETP_1536		9	0-1023	
207	B_V_INPUT_SETP_2048		4	0-1023	
208	B_V_INPUT_SETP_2560		0	0-1023	
209	B_V_INPUT_SETP_3072		1020	0-1023	
210	B_V_INPUT_SETP_3584		1018	0-1023	
211	B_V_INPUT_SETP_4096		1016	0-1023	
212	ERPPOL		84	0-4095	
213	FRP_POS		33	0-255	
214	SWAP		512	0-2047	
215	PRE_COLSHD_SEL		0	0-255	
216	HSYNC_FOLLOW		1	0-1	
217	DELAY_HSYNC		0	0-2047	
218	DELAY_VSYNC		8	0-255	
219	VSYNC_FOLLOW		0	0-1	
220	BLANK_RCENTER		0	0-2047	
221	BLANK_RSTART		128	0-255	
222	BLANK_REND		128	0-255	
223	BLANK_GCENTER		0	0-2047	
224	BLANK_GSTART		128	0-255	
225	BLANK_GEND		128	0-255	
226	BLANK_BCENTER		0	0-2047	
227	BLANK_BSTART		128	0-255	

Electrical Adjustments

Group/Item	Item Name	Function	Initial	Range	Note
228	BLANK_BEND		128	0-255	
229	Output limit R		3359/4092/3359/3359/3359	0-4095	
230	Output limit G		3359/4092/3359/3359/3359	0-4095	
231	Output limit B		3359/4092/3359/3359/3359	0-4095	
232	CROSSTALK_COEF_R		1023	0-1023	
233	CROSSTALK_COEF_G		1023	0-1023	
234	CROSSTALK_COEF_B		1023	0-1023	
235	LCCON_ENABLE		0	0-1	
236	ENBY_L1		33	0-255	
237	ENBY_H1		818	0-1023	
238	ENBY_L2		33	0-255	
239	ENBY_H2		818	0-1023	
Group 101	Panel Service(6200)				
0	R_LCCOM		137	0-255	
1	G_LCCOM		137	0-255	
2	B-LCCOM		137	0-255	
3	R-ENBX-PW		4	0-15	
4	G-ENBX-PW		4	0-15	
5	B-ENBX-PW		4	0-15	
6	R-DXIN		0	0-127	
7	G-DXIN		0	0-127	
8	B-DXIN		0	0-255	
9	R-ENB11N		8	0-31	
10	G-ENBX11N		8	0-31	
11	B-ENBX11N		8	0-31	
12			0/0	0-3	
13	R-FPDDR1M		1/0	0-1	
14			1/0	0-1	
15			0	0-7	
16	R-PARA1		1	0-1	
17	R-PARA2		868	0-1023	
18	R-PARA3		867	0-1023	
19	R-FPDDR1		868	0-1023	
20	R-FPDDR11		921	0-1023	
21			2/2	0-3	
22	G-FPDDR1M		1/0	0-1	
23			1/0	0-1	
24			0	0-7	
25	G-PARA1		1	0-1	
26	G-PARA2		868	0-1023	
27	G-PARA3		867	0-1023	
28	G-FPDDR1		868	0-1023	
29	G-GPDDR11		921	0-1023	
30			2/2	0-3	
31	B-FPDDR1M		1/0	0-1	
32			1/0	0-1	
33			0	0-7	
34	B-PARA1		1	0-1	
35	B-PARA2		868	0-1023	
36	B-PARA3		867	0-1023	
37	B-FPDDR1		868	0-1023	
38	B-FPDDR11		921	0-1023	
Group 102	Auto Keystone Setup Value				
0	OFFSET		0	-1056 - 1056	
1	OFFSET SWITCH		0	0 - 1	
2	DEBUG MODE		0	0 - 1	
3	SERVICE CALIBRATION		0	0 - 10	
4	LOCK COUNT		5	1 - 255	
5	DELT VERT RESULT		64	1 - 255	
6	ANGLE 1 COUNT		1	1 - 10	
7	ANGLE 2 COUNT		5	1 - 10	
8	BLIND SECTOR 1		160	0 - 1024	
9	BLIND SECTOR 3		32	0 - 1024	
10	BLIND SECTOR BIAS		61	0 - 1024	
Group 200	Option				
0	Logo Prohibition	Logo Prohibition (0: Menu, 1: Forced)	0	0 - 1	Effective after AC On

Electrical Adjustments

Group/Item	Item Name	Function	Initial	Range	Note
1	RS232C Baudrate	Baud Rate	0	0 - 2	0: 19200bps, 1: 9600bps, 2: 115200bps
4	CABLE SW	Long Cable	0	0 - 1	0: Disable 1: Enable
5	PW Debug Command Enable		0	0 - 1	0:Disable (Serial Command Enable) 1: Enable (PW Debug Mode)
6	Device Refresh Disable		0	0 - 1	0:Enable, 1:Disable No last memory
7	Device Access Disable		0	0 - 1	0:Enable (Normal), 1:Disable No last memory
50	Lamp Replacement Display		1	0-1	1: On, 0: Off
51	Filter Warning Display	Filter Warning Display On / Off	1	0-1	1: On, 0: Off
52	Lamp Counter Reset Times	Reset Times of Lamp Counter	0	0-255	Read only
53	Filter Counter Reset Times	Filter Counter Reset Times	0	0-255	
54	Factory Default Execute Times	Reset times of Factory Default	0	0-255	Read only
56	Menu Position	Move menu (X axis)	0	0 - 1024	
57	Menu Position	Move menu (Y axis)	0	0 - 1024	
59	Source Search Enable	Source Search Enable (0: Disable 1:Enable)	0	0-1	
65	Mute Setting In Freeze status	Mute On/Off in Freeze status	1	0-1	1: On, 0: Off
Group 201 Option (signal)					
0	FrameLock Option	0: FrameLockOFF at PC signal 1: FrameLockON at PC signal and 47Hz (Vfreq) ~ Panel frequency of input signal	1	0 - 1	
2	Field Sense Invert Enable	Reverse Processing of FLDINVSetting Value 0: Disable - Used FLDINV Setting Value 1: Enable - Used Reversed FLDINV Setting Value	0	0 - 1	
4	Sub Image Enable	0:Disable (Service Adjustment Disable, Used all the Center Values) 1:Enable (Service Adjustment Enable)	1	0 - 1	
6	Zoom Accelerator Enable	0:Zoom Accelerator OFF, 1:Zoom Accelerator ON No last memory	0	0 - 1	
7	DZoom Reset by Keystone		0	0 - 1	
8	Stability Count		5	0 - 255	
9	Sensitivity for Signal Lost (HSYNC)		350	0 - 32767	
10	Sensitivity for Signal Lost (VSYNC)		3	0 - 255	
11	Keystone Filter Center Value		16	0 - 30	
Group 202 Option(MCI)					
1	SIMPLE_CHANNEL_NUM		11	0 - 11	
Group 205 Spread Spetrum					
0	Enable	0=Enable, 1=Disable	1	0 - 1	
1	Modulation frequency		80	1 - 500	
2	Diffusivity		100	0 - 300	
Group 210 Lamp Control					
0	DIMMER_CTRL_LEVEL1	Level-1 data for dimming brightness: when less than the dimming level 1	7	0 - 255	
1	DIMMER_CTRL_LEVEL2	Level-2 data for dimming brightness: when less than the dimming level 2	14	0 - 255	
2	DIMMER_CTRL_LEVEL3	Level-3 data for dimming brightness: when less than the dimming level 3	21	0 - 255	
3	DIMMER_CTRL_LEVEL4	Level-4 data for dimming brightness: when less than the dimming level 4	28	0 - 255	
4	DIMMER_CTRL_LEVEL5	Level-5 data for dimming brightness: when less than the dimming level 5	35	0 - 255	

Electrical Adjustments

Group/ Item	Item Name	Function	Initial	Range	Note
5	DIMMER_CTRL_LEVEL6	Level-6 data for dimming brightness: when less than the dimming level 6	42	0 - 255	
6	DIMMER_CTRL_LEVEL7	Level-7 data for dimming brightness: when less than the dimming level 7	49	0 - 255	
7	DIMMER_CTRL_LEVEL8	Level-8 data for dimming brightness: when less than the dimming level 8	56	0 - 255	
8	DIMMER_CTRL_LEVEL9	Level-9 data for dimming brightness: when less than the dimming level 9	63	0 - 255	
9	DIMMER_CTRL_LEVEL10	Level-10 data for dimming brightness: when less than the dimming level 10	70	0 - 255	
	DIMMER_CTRL_LEVEL11	Level-11 data for dimming brightness: when less than the dimming level 11	77	0 - 255	
11	DIMMER_CTRL_LEVEL12	Level-12 data for dimming brightness: when less than the dimming level 12	84	0 - 255	
12	DIMMER_CTRL_LEVEL13	Level-13 data for dimming brightness: when less than the dimming level 13	91	0 - 255	
13	DIMMER_CTRL_LEVEL14	Level-14 data for dimming brightness: when less than the dimming level 14	98	0 - 255	
14	DIMMER_CTRL_LEVEL15	Level-15 data for dimming brightness: when less than the dimming level 15	105	0 - 255	
15	DIMMER_AVERAGE_POINT	Luminance Data Average Point for Dimmer	4	1 - 16	
16	DIMMER_AVERAGE_DATA	Luminance Data Average Value for Dimmer	-	-	* Read only
17	DIMMER_LEVEL_AUTO	Current Dimmer Level	-	-	* Read only
18	DIMMER_LEVEL_NORMAL	Normal Dimmer Level	15	0 - 15	
19	DIMMER_LEVEL_ECO	Eco Dimmer Level	0	0 - 15	
20	Panel life mode	Panel life mode	0	0 - 1	
21	VOLTAGE_LEVEL	Lamp Voltage	-	-	Unit: 8bit(Raw Data) * Read only
22	DIMMER_LEVEL_HIGH		15	0 - 15	
Group 230 VBI Slice Level					
0	Generic Initial Slicing Level	PW190 register 0xE344	9	0-255	
1	Generic High Level Threshold	PW190 register 0xE345	0	0-255	
2	Generic Low Level Threshold	PW190 register 0xE346	0	0-255	
3	Generic Minimum Low Level	PW190 register 0xE347	0	0-255	
4	Generic Maximum High Level	PW190 register 0xE348	255	0-255	
Group 250 FAN Control * Fan voltage adjustment					
0	FAN1 (DAC) MIN ADJUST	DAC Output for Fan Adjust the tolerance of DAC and Fan Voltage. * Lamp mode is forced Eco	28	0-255	
1	FAN1 (DAC) MAX ADJUST		205	0-255	
2	FAN2 (DAC) MIN ADJUST		36	0-255	
3	FAN2 (DAC) MAX ADJUST		207	0-255	
4	FAN3 (DAC) MIN ADJUST		30	0-255	
5	FAN4 (DAC) MAX ADJUST		235	0-255	
Group 252 Fan Option					
0	HI-LAND SWITCH	0: Normal, 1: Hi-Land, 2-4: Hi-Land "1-3"	0	0 - 2	* Read only
1	SAFETY Switch	For test purpose	0	0.3 - 6	
2	FAN MANUAL SWITCH	0: Auto, 1: Manual	0	0 - 3	
3	FAN1 MANUAL VOLT-AGE		100	0 - 255	
4	FAN2 MANUAL VOLT-AGE	Fan Voltage (unit : 0.1V) Effective only when Fan Manual switch is 1	100	0 - 255	
5	FAN3 MANUAL VOLT-AGE		100	0 - 255	

Electrical Adjustments

Group/Item	Item Name	Function	Initial		Range		Note
Group 253	Fan Temp Error Setting (Memorized)		Normal (OFF)	Ceiling (OFF)	HiLand Normal (ON1/ON2)	HiLand Ceiling (ON1/ON2)	
5	Temp A Warning (Normal)		43	43	0/40	0/40	30 - 100
6	Temp B Warning (Normal)		52	52	0/52	0/52	30 - 100
7	Temp C Warning (Normal)		60	60	0/55	0/55	30 - 100
8	Temp B-A Warning (Normal)		100	100	100/100	100/100	0 - 100
9	Temp C-A Warning (Normal)		100	100	100/100	100/100	0 - 100
10	Temp A Warning (Eco)	Temp. A to judge the Temp Error at Normal (Room)	42	42	0/40	0/40	30-100
11	Temp B Warning (Eco)	Temp. B to judge the Temp Error at Normal (Panel)	54	54	0/50	0/50	-
12	Temp C Warning (Eco)	Temp. C to judge the Temp Error at Normal (Lamp)	60	60	0/52	0/52	30-100
13	Temp B-A Warning (Eco)	Temp. B-A to judge the Temp Error at Normal (Clogging Det.)	100	100	100/100	100/100	0-100
14	Temp C-A Warning (Eco)	Temp. C-A to judge the Temp Error at Normal (Clogging Det.)	100	100	100/100	100/100	0-100
15	Temp A Warning Offset (Temp)			5			0-100
16	Temp B Warning Offset (Temp)	Offset of Temp Error (Temp.) Error Setting Value is increased XC at the below condition		5			0-100
17	Temp C Warning Offset (Temp)	* Standby		10			0-100
18	Temp B-A Warning Offset (Temp)	* Right to turn on the lamp * Right to change the Lamp mode		0			0-100
19	Temp C-A Warning Offset (Temp)			0			0-100
20	Temp A Warning Offset (Time)			3			0-5
21	Temp B Warning Offset (Time)	Offset of Temp Error (Minutes) Error Setting Value is increased		3			0-5
22	Temp C Warning Offset (Time)	X minute at the below condition * Standby		3			0-5
23	Temp B-A Warning Offset (Time)	* Right to turn on the lamp * Right to change the Lamp mode		3			0-5
24	Temp C-A Warning Offset (Time)			3			0-5
Group 254	Fan Control Range Setting (Temp./Voltage)		Normal (OFF)	Ceiling (OFF)	HiLand Normal (ON1 DIF/ON2)	HiLand Ceiling (ON1 DIF/ON2)	
10	High Fan Control Min Temp		35	35	0/32	0/32	20 - 100
11	High Fan Control Max Temp		40	40	0/38	0/38	20 - 100
12	High Fan1 Min		65	65	-10/125	-10/125	0 - 255
13	High Fan1 Max		135	135	0/135	0/135	0 - 255
14	High Fan2 Min		65	65	-10/90	-10/90	0 - 255
15	High Fan2 Max		120	120	0/135	0/135	0 - 255
16	High Fan3 Min		77	77	-5/85	-5/85	0 - 255
17	High Fan3 Max		90	90	-5/100	-5/100	0 - 255
20	Eco Fan Control Min Temp	Temp Sensor Control Start/End	36	36	0/32	0/32	20-100
21	Eco Fan Control Max Temp	Temp.p at Eco	39	39	0/38	0/38	20-100
22	Eco Fan1 Min		45	45	-10/110	-10/110	0-255
23	Eco Fan1 Max		120	120	0/120	0/120	0-255
24	Eco Fan2 Min	Fan voltage value at Eco (unit: 0.1V)	50	50	-10/85	-10/85	0-255
25	Eco Fan2 Max		100	100	0/100	0/100	0-255
26	Eco Fan3 Min		55	55	-5/60	-5/60	0-255
27	Eco Fan3 Max		65	65	-5/80	-5/80	0-255
Group 255	Fan Start/Cooling Setting						
0	Fan1 Initial Volt	Fan Start Voltage (0.1V)		50			0-255
1	Fan2 Initial Volt			50			0-255
2	Fan3 Initial Volt	Fan Start Voltage (0.1V)		50			0-255
4	Fan1 Cooling Speed	Power off :Fan Voltage(0.1V)		45			0-255
5	Fan2 Cooling Speed	Power off :Fan Voltage(0.1V)		60			0-255
6	Fan3 Cooling Speed	Power off :Fan Voltage(0.1V)		135			0-255
8	Cooling Time L1	Cooling Time setting at Fan Mode L1 (x 30 sec) 1: 30, 3: 90, 15: 450 sec.		2			1-15
9	Cooling Time L2	Cooling Time setting at Fan Mode L2 (x 30 sec) 1: 30, 3: 90, 15: 450 sec.		3			1-15

Electrical Adjustments

Group/Item	Item Name	Function	Initial	Range	Note
10	Temp Error Cooling Time	Cooling Time setting at Temp Error (x 30 sec) 1: 30, 3: 90, 15: 450 sec.	3	1-15	
11	OnStart Cooling Start Threshold		38	0-100	
12	After shutdown cooling	Cooling after shutdown (0: No, 1: Yes)	1	0-1	
Group 256	Fan Lamp Voltage Lower Setting				
0	Lamp Voltage	Current-voltage lamp (unit: 0.1V) (Read only)	-	0-255	
1	Lamp Voltage Threshold	V x 10 unit threshold is determined that the lamp voltage drops	0	30-90	
2	Fan1 Speed Gain	Min Fan voltage plus the amount of time the lamp voltage drops	10	0-255	
3	Fan2 Speed Gain	(unit: 0.1V)	10	0-255	
4	Fan3 Speed Gain		10	0-255	
Group 257	Fan Dimmer Setting				
0	Dimmer Average Check Period	Average Time to Measurement 0: 10 sec, 1:30 sec, 2: 60 sec, 3: 90 sec.	1	0-10	
1	Dimmer Average	Average Dimmer	-	-	
2	Last Voltage Difference	Last Voltage Difference (x0.1V)	-	-	
3	Voltage Difference Goal	Target Voltage Difference (0.1V)	-	-	
Group 260	Auto Calibration (Commn) * Auto Calibration				
0	Execute Calibration	Executes Auto-Calibration when changing the Value to 1 (PC White 100%)	0	0 - 1	
1	Loop Count	Maximum Execution Times (OFFSET->GAIN)	10	1 - 30	
2	Auto Status	Result of Auto-Calibration (Last Memory)	0	0 / 1 / 9	0: OK, 1: Adjusting, 2: Error * ReadOnly
3	AutoWait	Wait Value for each setting	1	1 - 20	
4	CHECK -Tolerance	Tolerance of OFFSET	2	1 - 255	
Group 261	Auto Calibration (RGB)				
0	OFFSET AREA H START	Black Level Acquiring Area H-Start Position	975	0 - 1000	
1	OFFSET AREA V START	Black Level Acquiring Area V-Start Position	500	0 - 1000	
2	GAIN AREA H START	White Level Acquiring Area H-Start Position	25	0 - 1000	
3	GAIN AREA V START	White Level Acquiring Area V-Start Position	500	0 - 1000	
4	Image AREA H WIDTH	Black/White Level Acquiring Area	13	0 - 4095	
5	Image AREA V HEIGHT	Black/White Level Acquiring Area Height	9	0 - 4095	
6	OFFSET target	Target Value of Black Level Adj.	3	0 - 127	
7	OFFSET tolerance	Tolerance of Black Level Adj.	1	1 - 127	
8	GAIN target	Target Value of White Level Adj.	238	0 - 255	
9	GAIN tolerance	Tolerance of White Level Adj.	1	1 - 255	
Group 262	Auto Calibration (CVBS/SVIDEO)				
0	Y Image Area Start X	Y Acquiring Area H-Start Position	20	0 - 1000	
1	Y Image Area Start Y	Y Acquiring Area V-Start Position	200	0 - 1000	
6	Image Area H Width	Image Level Acquiring Area	8	0 - 4095	
7	Image Area V Height	Image Level Acquiring Area Height	9	0 - 4095	
8	Y Target Level	Target Value of Y Level Adj.	217	0 - 255	
11	Gain Tolerance	Tolerance of Level Adj.	1	0 - 255	
12	Delta Gain	Deviation Width of Gain Value	9	0 - 255	
Group 264	Auto Calibration (YCbCr)				
0	Y-OFFSET AREA H START	Y - Offset Acquiring Area H-Start Position	925	0 - 1000	
1	Y-OFFSET AREA V START	Y - Offset Acquiring Area V-Start Position	500	0 - 1000	
2	CB - OFFSET AREA H START	CB - Offset Acquiring Area H-Start Position	925	0 - 1000	If not used: use Y's value
3	CB - OFFSET AREA V START	CB - Offset Acquiring Area V-Start Position	500	0 - 1000	If not used: use Y's value
4	CR - OFFSET AREA H START	CR - Offset Acquiring Area H-Start Position	925	0 - 1000	If not used: use Y's value
5	CR - OFFSET AREA V START	CR - Offset Acquiring Area V-Start Position	500	0 - 1000	If not used: use Y's value
6	Y - GAIN AREA H START	Y	50	0 - 1000	
7	Y - GAIN AREA V START		500	0 - 1000	
8	CB - GAIN AREA H START		800	0 - 1000	

Electrical Adjustments

Group/Item	Item Name	Function	Initial	Range	Note
9	CB - GAIN AREA V START		500	0 - 1000	
10	CR - GAIN AREA H START		700	0 - 1000	
11	CR - GAIN AREA V START		500	0 - 1000	
12	Image AREA H WIDTH	YCBCR Level Acquiring Area	13	0 - 4095	
13	Image AREA V HIGHT	YCBCR Level Acquiring Area Height	9	0 - 4095	
14	Y - OFFSET TARTGET		4	0 - 255	
15	CB OFFSET TARGET		128	0 - 255	
16	CR OFFSET TARGET		128	0 - 255	
17	Y - GAIN TARGET		217	0 - 255	
18	CB - GAIN TARGET		237	0 - 255	
19	CR - GAIN TARGET		237	0 - 255	
20	OFFSET torelance	Torelance of OFFSET Adj.	1	1 - 255	
21	GAIN torelance	Torelance of GAIN Adj.	1	1 - 255	
Group 270	CUSTOM(Aspect)				
0	Scaler Horizontal	Scaler Horizontal	100	68 - 132	
1	Scaler Vertical	Scaler Vertical	100	68 - 132	
2	Connect	0:Individual 1:Normal	0	0 - 1	
3	Position Horizontal	Position Horizontal	100	85 - 115	
4	Position Vertical	Position Vertical	100	85 - 115	
5	Aspect Enable	TRUE:Enable FALSE:Disable	0	0 - 1	
Group 280	AutoPC Adjust				
0	AutoPCAdjustEnable	Auto-PC Adj Operation Enable if Un-supported Signal Input	0	0 - 1	0: Enable, 1: Disable
1	Frequency Step	Frequency Steps of TotalDot	1	0-3	
2	Frequency Threshold	Total Dot Frequency Threshold	5	0 - 10	0 [] <--- -----> 10[Not matched]
3	Fine Phase	Do Phase Adj after Total Dot Adj.	1	0 - 1	0: Executes Fine Phase, 1: Not Execute
4	BLKDET	Black Level Detection Area	1	0 - 7	
5	PHASEMSK	Phase Detection Filter	0	0 - 3	0: Effective All Bit, 1: Disable Lower 1 bit 2: Disable Lower 2 bit, 3: Disable Lower 3 bit
Group 290	Panel Type				
0	GammaL/R-View		0	0-20	0: Gamma for L-Turn 20: Gamma for R-Turn * Read only
1	GammaL/R-Change	Sets L-Turn Gamma if the Value is set to 0. Sets R-Turn Gamma if the Value is set to 20.	10	0-20	
Group 430	Model No. Setting [No Name]				
0	Model No. Confirm	0:No Name 1:PT-TW230 / PT-TW231R 2:PT-TW230U / PT-TW231RU 3:PT-TW230E / PT-TW231RE 4:PT-TW230EJ / PT-TW231REA 5:PT-TW230EA / PT-TW231REAJ 6:PT-TW230EAJ / PT-TW231REAJ 7:PT-XW23ST / PT-XW25SR	0	-	
1	Model No. Setting	Model No. is set when the value is set 0 to 10.	0	0 - 10	
Group 431	Model No. Setting [PT-TW230 / PT-TW231R]				
0	Model No. Confirm	* Refer to S430-0	0	-	
1	Model No. Setting	Model No. is set when the value is set to 10.	0	0 - 10	
Group 432	Model No. Setting [PT-TW230U / PT-TW231RU]				
0	Model No. Confirm	* Refer to S430-0	0	-	
1	Model No. Setting	Model No. is set when the value is set to 10.	0	0 - 10	
Group 433	Model No. Setting [PT-TW230E / PT-TE231RE]				
0	Model No. Confirm	* Refer to S430-0	0	-	
1	Model No. Setting	Model No. is set when the value is set to 10.	0	0 - 10	
Group 434	Model No. Setting [PT-TW230EJ / PT-TW231EJ]				

Electrical Adjustments

Group/Item	Item Name	Function	Initial	Range	Note
0	Model No. Confirm	* Refer to S430-0	0	-	
1	Model No. Setting	Model No. is set when the value is set to 10.	0	0 - 10	
Group 435	Model No. Setting [PT-TW230EA / PT-TW231RA]				
0	Model No. Confirm	* Refer to S430-0	0	-	
1	Model No. Setting	Model No. is set when the value is set to 10.	0	0 - 10	
Group 436	Model No. Setting [PT-TW230EAJ / PT-TW231RAJ]				
0	Model No. Confirm	* Refer to S430-0	0	-	
1	Model No. Setting	Model No. is set when the value is set to 10.	0	0 - 10	
Group 437	Model No. Setting [PT-XW23ST / PT-XW25SR]				
0	Model No. Confirm	* Refer to S430-0	0	-	
1	Model No. Setting	Model No. is set when the value is set to 10.	0	0 - 10	
Group 500	Composite (NTSC)(For Composite/S-Video)				
1	Disp Dots		668	0 - 4095	
2	H Back Porch		28	0 - 4095	
3	V Back Porch		18	0 - 4095	
4	Disp Line		458	0 - 4095	
Group 501	Composite (PAL)(For Composite/S-Video)				
1	Disp Dots		658	0 - 4095	
2	H Back Porch		34	0 - 4095	
3	V Back Porch		22	0 - 4095	
4	Disp Line		536	0 - 4095	
Group 502	Composite (SECAM)(For Composite/S-Video)				
1	Disp Dots		652	0 - 4095	
2	H Back Porch		28	0 - 4095	
3	V Back Porch		22	0 - 4095	
4	Disp Line		536	0 - 4095	
Group 510	SCART (480i)				
1	Disp Dots		674	0 - 4095	
2	H Back Porch		132	0 - 4095	
3	V Back Porch		43	0 - 4095	
4	Disp Line		452	0 - 4095	
Group 511	SCART (575i)				
1	Disp Dots		650	0 - 4095	
2	H Back Porch		152	0 - 4095	
3	V Back Porch		68	0 - 4095	
4	Disp Line		514	0 - 4095	
Group 520	YCbCr (480i)				
0	Total Dots		858	0 - 4095	
1	Disp Dots		670	0 - 4095	
2	H Back Porch		146	0 - 4095	
3	V Back Porch		48	0 - 4095	
4	Disp Line		458	0 - 4095	
Group 521	YCbCr (575i)				
0	Total Dots		864	0 - 4095	
1	Disp Dots		656	0 - 4095	
2	H Back Porch		162	0 - 4095	
3	V Back Porch		64	0 - 4095	
4	Disp Line		534	0 - 4095	
Group 522	YCbCr (480p)				
0	Total Dots		858	0 - 4095	* Read only
1	Disp Dots		684	0 - 4095	

Electrical Adjustments

Group/ Item	Item Name	Function	Initial	Range	Note
	2	H Back Porch	136	0 - 4095	
	3	V Back Porch	46	0 - 4095	
	4	Disp Line	460	0 - 4095	
Group 523	YCbCr (575p)				
	0	Total Dots	864	0 - 4095	* Read only
	1	Disp Dots	690	0 - 4095	
	2	H Back Porch	142	0 - 4095	
	3	V Back Porch	56	0 - 4095	
	4	Disp Line	550	0 - 4095	
Group 524	YCbCr (720p - 60)				
	0	Total Dots	1650	0 - 4095	* Read only
	1	Disp Dots	1248	0 - 4095	
	2	H Back Porch	313	0 - 4095	
	3	V Back Porch	34	0 - 4095	
	4	Disp Line	700	0 - 4095	
Group 525	YCbCr (720p - 50)				
	0	Total Dots	1980	0 - 4095	* Read only
	1	Disp Dots	1248	0 - 4095	
	2	H Back Porch	338	0 - 4095	
	3	V Back Porch	36	0 - 4095	
	4	Disp Line	700	0 - 4095	
Group 526	YCbCr (1080i - 60)				
	0	Total Dots	2200	0 - 4095	* Read only
	1	Disp Dots	1872	0 - 4095	
	2	H Back Porch	256	0 - 4095	
	3	V Back Porch	54	0 - 4095	
	4	Disp Line	1052	0 - 4095	
Group 527	YCbCr (1080i - 50)				
	0	Total Dots	2640	0 - 4095	* Read only
	1	Disp Dots	1870	0 - 4095	
	2	H Back Porch	257	0 - 4095	
	3	V Back Porch	54	0 - 4095	
	4	Disp Line	1052	0 - 4095	
Group 528	YCbCr (1035i)				
	0	Total Dots	2200	0 - 4095	* Read only
	1	Disp Dots	1872	0 - 4095	
	2	H Back Porch	256	0 - 4095	
	3	V Back Porch	92	0 - 4095	
	4	Disp Line	1012	0 - 4095	
Group 540	RGB Video (480i)				
	0	Total Dots	960	0 - 4095	
	1	Disp Dots	752	0 - 4095	
	2	H Back Porch	166	0 - 4095	
	3	V Back Porch	48	0 - 4095	
	4	Disp Line	460	0 - 4095	
	5	Clamp	1	0 - 255	* Read only
	6	Clamp Width	31	0 - 255	* Read only
Group 541	RGB Video (575i)				
	0	Total Dots	966	0 - 4095	
	1	Disp Dots	736	0 - 4095	
	2	H Back Porch	182	0 - 4095	
	3	V Back Porch	66	0 - 4095	
	4	Disp Line	536	0 - 4095	
	5	Clamp	1	0 - 255	* Read only
	6	Clamp Width	31	0 - 255	* Read only
Group 542	RGB Video (480p)				
	0	Total Dots	960	0 - 4095	
	1	Disp Dots	766	0 - 4095	

Electrical Adjustments

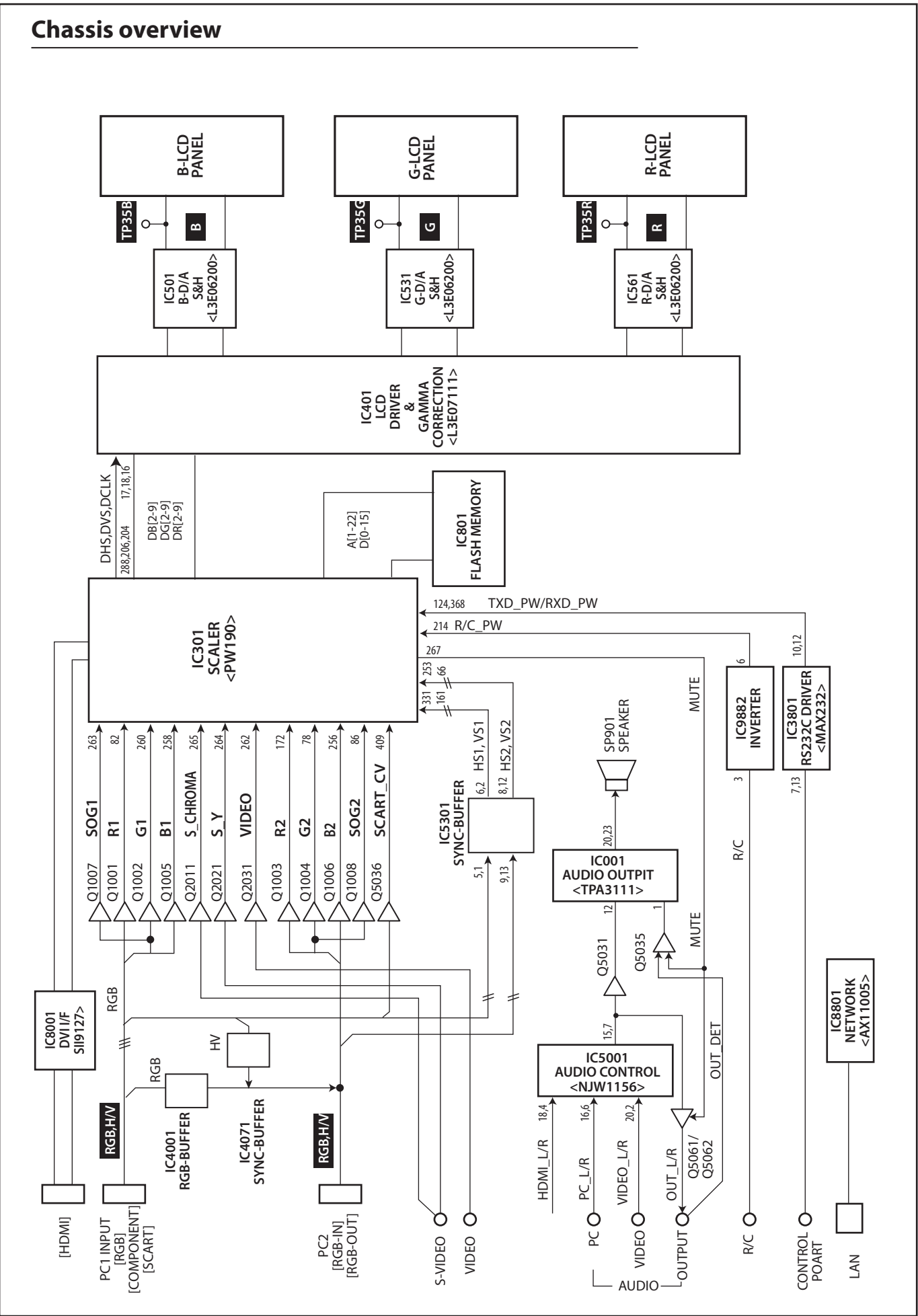
Group/Item	Item Name	Function	Initial	Range	Note
2	H Back Porch		156	0 - 4095	
3	V Back Porch		46	0 - 4095	
4	Disp Line		460	0 - 4095	
5	Clamp		1	0 - 255	* Read only
6	Clamp Width		31	0 - 255	* Read only
Group 543 RGB Video (575p)					
0	Total Dots		986	0 - 4095	
1	Disp Dots		774	0 - 4095	
2	H Back Porch		174	0 - 4095	
3	V Back Porch		62	0 - 4095	
4	Disp Line		540	0 - 4095	
5	Clamp		1	0 - 255	* Read only
6	Clamp Width		31	0 - 255	* Read only
Group 544 RGB Video (720p - 60)					
0	Total Dots		1650	0 - 4095	
1	Disp Dots		1246	0 - 4095	
2	H Back Porch		318	0 - 4095	
3	V Back Porch		36	0 - 4095	
4	Disp Line		698	0 - 4095	
5	Clamp		1	0 - 255	* Read only
6	Clamp Width		31	0 - 255	* Read only
Group 545 RGB Video (720p - 50)					
0	Total Dots		1980	0 - 4095	
1	Disp Dots		1246	0 - 4095	
2	H Back Porch		310	0 - 4095	
3	V Back Porch		34	0 - 4095	
4	Disp Line		702	0 - 4095	
5	Clamp		1	0 - 255	* Read only
6	Clamp Width		31	0 - 255	* Read only
Group 546 RGB Video (1080i - 60)					
0	Total Dots		2200	0 - 4095	
1	Disp Dots		1872	0 - 4095	
2	H Back Porch		260	0 - 4095	
3	V Back Porch		58	0 - 4095	
4	Disp Line		1046	0 - 4095	
5	Clamp		1	0 - 255	* Read only
6	Clamp Width		31	0 - 255	* Read only
Group 547 RGB Video (1080i - 50)					
0	Total Dots		2640	0 - 4095	
1	Disp Dots		1872	0 - 4095	
2	H Back Porch		260	0 - 4095	
3	V Back Porch		56	0 - 4095	
4	Disp Line		1050	0 - 4095	
5	Clamp		1	0 - 255	* Read only
6	Clamp Width		31	0 - 255	* Read only
Group 548 RGB Video (1035i)					
0	Total Dots		2200	0 - 4095	
1	Disp Dots		1872	0 - 4095	
2	H Back Porch		260	0 - 4095	
3	V Back Porch		92	0 - 4095	
4	Disp Line		1008	0 - 4095	
Group 560 HDCP (480p)					
7	OverScan	Over Scan Rate (0 ~ 25.5% at 0.1% steps)	0	0 - 255	
8	VSBEG		2	0 - 15	
Group 561 HDCP (575p)					
7	OverScan	Over Scan Rate (0 ~ 25.5% at 0.1% steps)	0	0 - 255	
8	VSBEG		2	0 - 15	

Electrical Adjustments

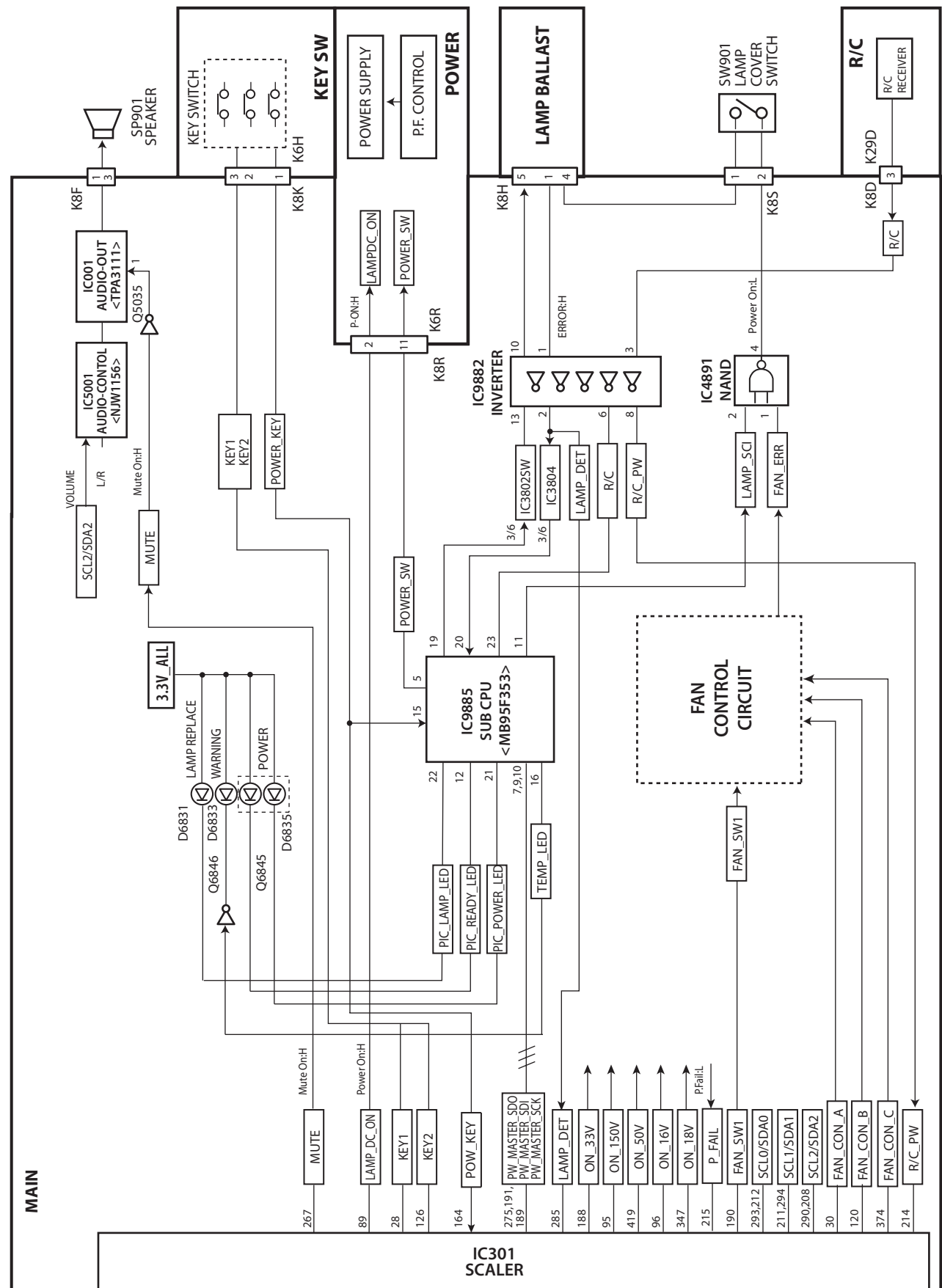
Group/ Item	Item Name	Function	Initial	Range	Note
Group 562	HDCP (720p - 60)				
8	VSBEg		2	0 - 15	
Group 563	HDCP (720p - 50)				
7	OverScan	Over Scan Rate (0 ~ 25.5% at 0.1% steps)	0	0 - 255	
8	VSBEg		2	0 - 15	
Group 564	HDCP (1080i - 60)				
7	OverScan	Over Scan Rate (0 ~ 25.5% at 0.1% steps)	0	0 - 255	
8	VSBEg		2	0 - 15	
Group 565	HDCP (1080i - 50)				
7	OverScan	Over Scan Rate (0 ~ 25.5% at 0.1% steps)	0	0 - 255	
8	VSBEg		2	0 - 15	
Group 566	HDCP (1035i)				
7	OverScan	Over Scan Rate (0 ~ 25.5% at 0.1% steps)	0	0 - 255	
8	VSBEg		2	0 - 15	
Group 981	Color Shading Adj Offset [L/ R]				
0	R-Max		0/0	0 - 255	
1	R-Mid1		0/0	0 - 255	
2	R-Mid2		0/0	0 - 255	
3	R-Min		0/0	0 - 255	
4	G-Max		0/0	0 - 255	
5	G-Mid1		0/0	0 - 255	
6	G-Mid2		0/0	0 - 255	
7	G-Min		0/0	0 - 255	
8	B-Max		0/0	0 - 255	
9	B-Mid1		0/0	0 - 255	
10	B-Mid2		0/0	0 - 255	
11	B-Min		0/0	0 - 255	

Chassis Block Diagrams

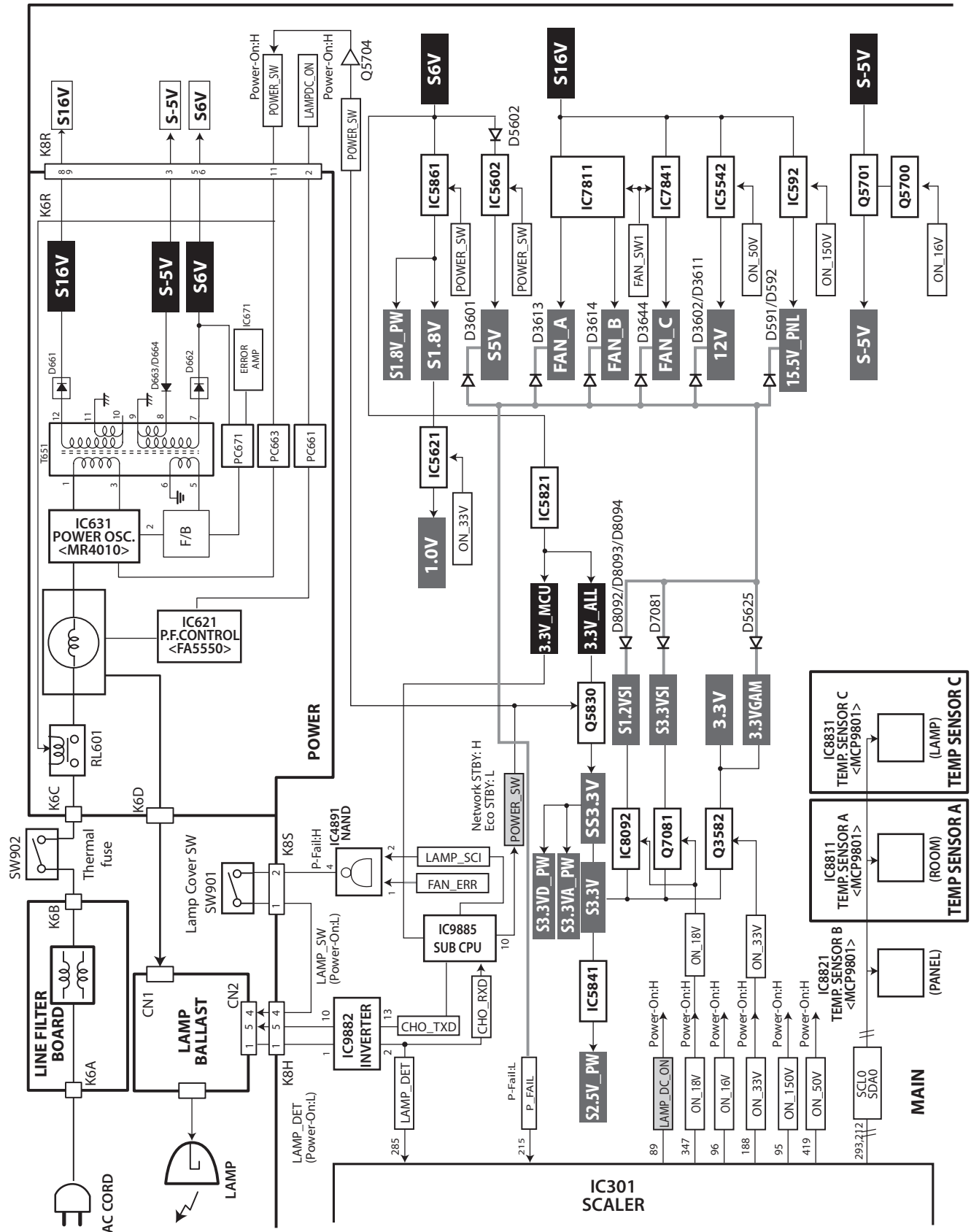
Chassis overview



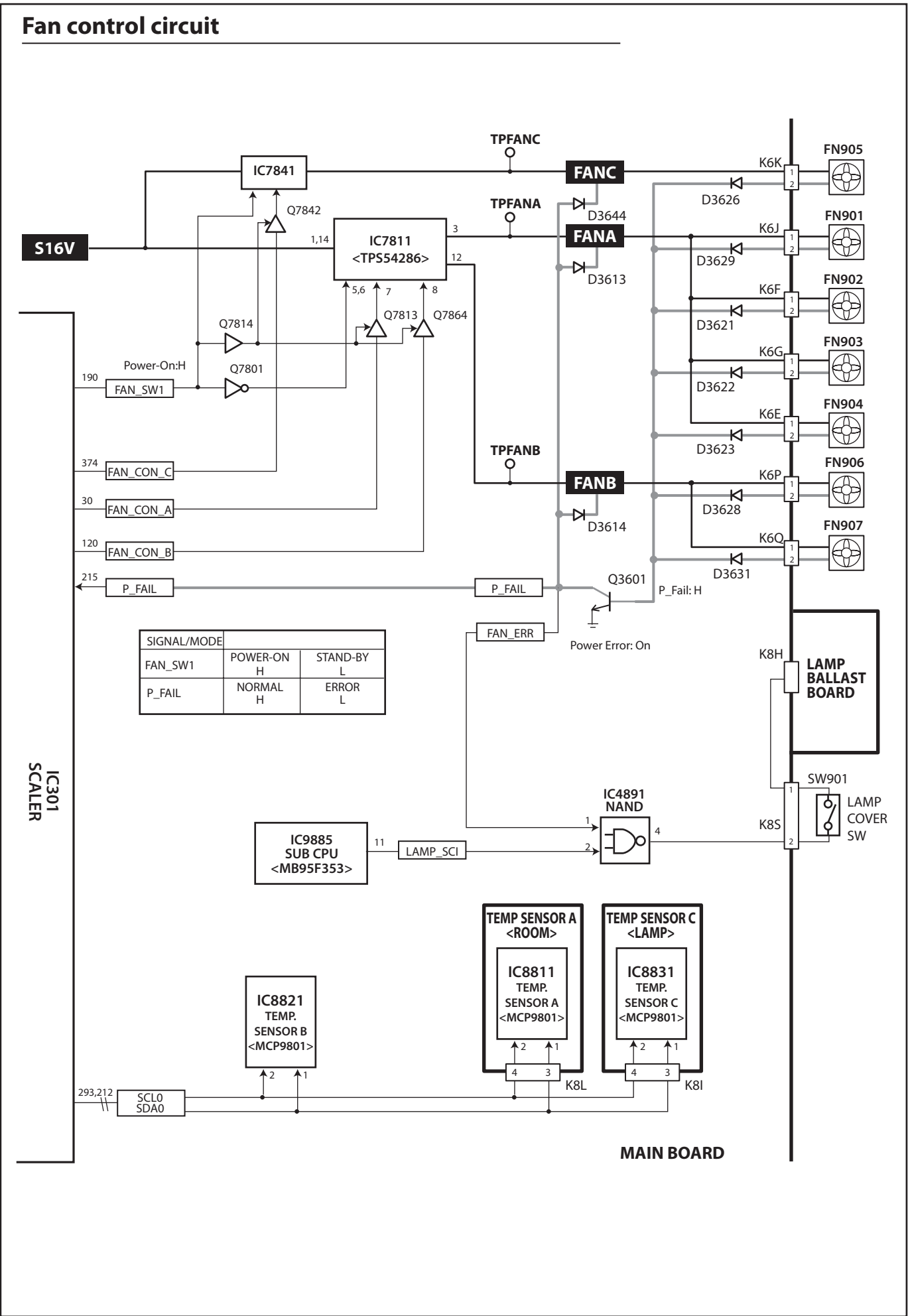
System control



Power supply & protection circuit



Fan control circuit



Troubleshooting

Indicators and projector condition

Each indicator on the projector indicates the operating status of the projector. If you find the un-expected operation during usage, check the projector's operation with the tables below. The indicators also let you know the maintenance sign. To use the projector in the best performance for a long period of time, take an adequate maintenance according to the indicator status.

ON(G)/STANDBY(R) indicator

Indicator status		Status
No illumination or flashing		The power cord is unplugged.
RED	Lit	The power cord is plugged.
		The projector is in stand-by mode, after the cooling is completed.
	Flashing	The projector cannot be turned on until the normal power-off processing for fan cooling is completing and the <ON(G)/STANDBY(R) >indicator stops blinking.
		The temperature inside the projector is abnormally high. And the <WARNING >indicator also blinks in red. The projector cannot be turned on until cooling is completing and the <ON(G)/STANDBY(R)/ > indicator stops blinking.
GREEN	Lit	Projecting.
	Flashing	The projector is in the power management mode.

LAMP indicator

Indicator	Lighting in yellow
Status	The projection lamp reaches its end of life.
Check	Is there a lamp replacement icon appears on the screen?
Remedy	Replace the lamp unit.


WARNING indicator

Indicator	Lights in red.	Blinks in red.
Status	The projector detects an abnormal condition and cannot be turned on.	The temperature inside the projector is abnormally high. The projector cannot be turned on. And the <ON(G)/STANDBY(R)> indicator also blinks in red.
Check	Unplug the AC power cord and plug it again to tuwrn on the projector.	<ul style="list-style-type: none">- Did you provide appropriate space for the projector to be ventilated? Check the installing condition to see if the air vents of the projector are not blocked.- Has the projector been installed near an Air-Conditioning/ Heating Duct or Vent?- Is the filter clean?
Remedy	If the projector is turned off again, the projector may have the internal error. It needs to check up or servicing.	<ul style="list-style-type: none">- Provide good installing condition to your projector.- Move the installation of the projector away from the duct or vent.- Replace filter unit.

Note:

- If <WARNING> indicator persists to light or blink after taking these measurements, the projector may have the internal error. Do not leave the projector on. It may cause an electric shock or a fire hazard.
- The projector detects an abnormal condition and cannot be turned on. Unplug the AC power cord and plug it again to turn on the projector. If the projector is turned off again, the projector may be defective. Do not leave the projector on. It may cause an electric shock or a fire hazard.

No power

This projector provides a function which can be specified a defective area simply by indicating the LEDs. Connect the AC cord and press the  button once and then check the LED indication.

- **When all of LED indicators are not lighting**, the symptom indicates that the primary power supply circuit does not operate properly. Check the power primary circuit and parts as follow;
AC cord, F601 (Fuse), Power board, SW902 (Thermal fuse)
SW902 opens when the surrounding temperature of the fuse exceeds 94°C.

- **When the WARNING (red) and ON(G)/STANDBY(R) (red) indicators are flashing**, the symptom indicates that the projector detected an abnormal temperature risen inside the projector. Check the air filter and remove the object near the intake and exhaust fan openings, and wait until the ON(G)/STANDBY(R) indicator stops flashing, and then try to turn on the projector.

The internal temperature is monitored by sensor ICs, IC8821 on the main board and IC8811 on the temp sensor A board, IC8831 on the temp sensor C board.

- **When the WARNING indicator lights red**, the symptom indicates that the projector detected an abnormality in the cooling fan operation or in the power supply secondary circuits. Check fan operation and power supply lines, and the driving signal status.

The P_FAIL signal (Error: L) is sent to pin 215 of IC301 <SCALER>, when the abnormality occurred inside the projector, and then the IC301 sends the shutdown signal, LAMP_DC_ON, to the power supply circuit to stop its operation, and the signal LAMP_SCI output from IC9885<SUB CPU> is sent to the lamp ballast board via IC4891<NAND> and SW901<lamp cover switch> to stop operation of the lamp circuit. LAMP_DET signal at the pin 285 of IC301 is applied from the lamp ballast unit. If the abnormality occurred on the lamp ballast unit, LAMP_DET signal becomes "High" and then IC301 shuts down the power supply circuit.

An abnormality occurs on the secondary power supply;

Check power supplies S16V, S6V, S-5V. P_FAIL signal becomes Low when the abnormality occurs on any of the power supply lines.

An abnormality occurs on the fan control circuit;

Check FN901, FN902, FN903, FN904, FN905, FN906, FN907 and peripheral circuit.

If any of the fans has an error, the fan lock signal drives Q3601 becomes "High". as the result, signal FAN_ERR becomes Low and is sent to lamp ballast board to stop lamp circuit.

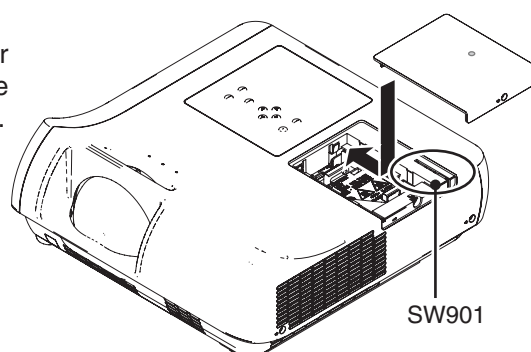
An abnormality occurs on the driving signals;

The table below shows the driving signal of each power supply.

Driving signal	IC output	Pin No.	I/O	Level	Swich/IC	Power/Circuit
ON_50V	IC301	419	O	H	IC5549	12V
ON_150V		95	O	H	IC592	15.5V_PNL
ON_33V		188	O	H	IC5621 O3582	1.0V 3.3V
ON_16V		96	O	H	Q5701	S-5V
POWER_SW	IC9885	5	O	H	IC2391 Q5830 IC5861 IC5602 RL601	S5V SS3.3V S1.8V S5V Standby circuit

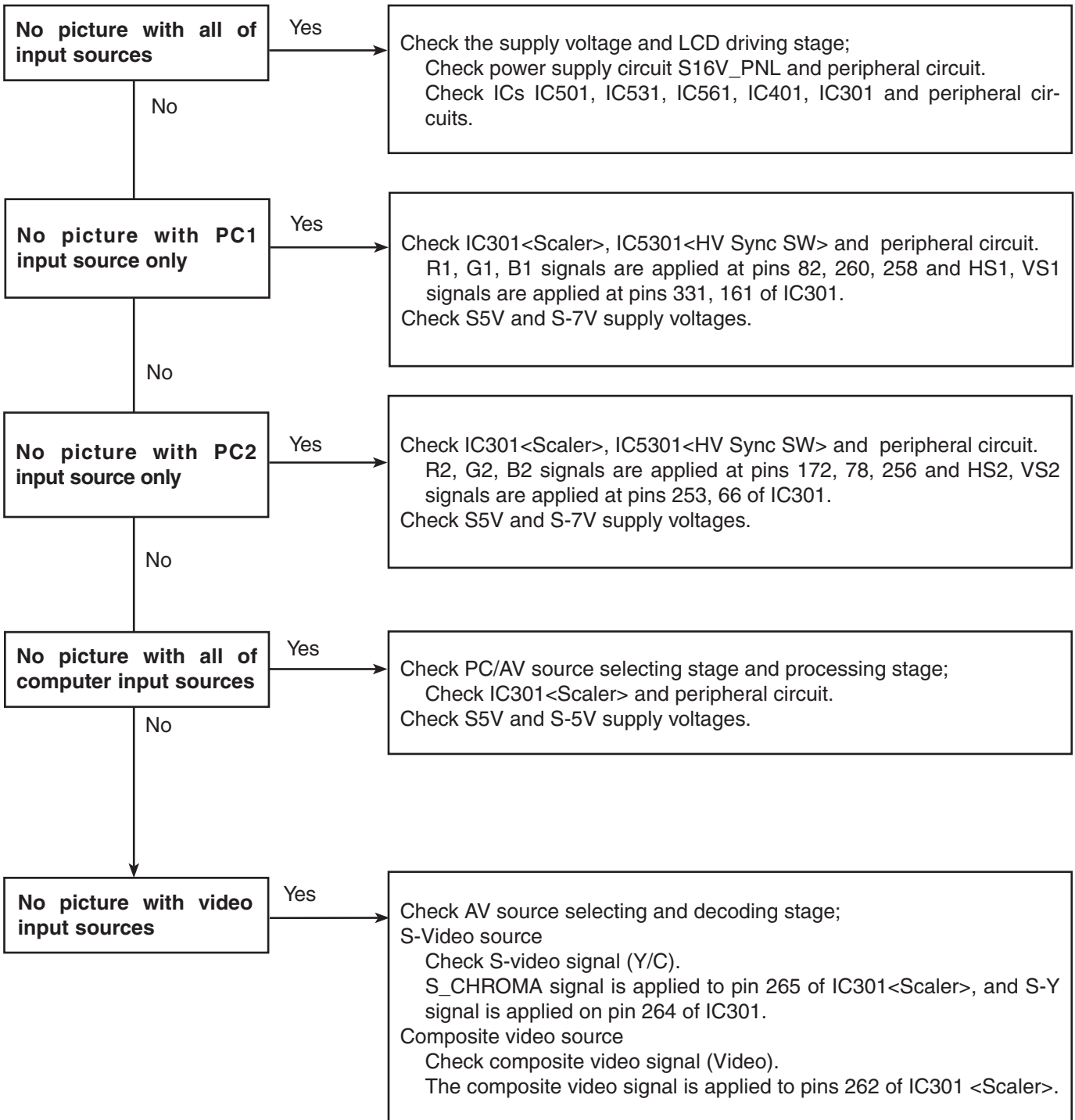
Lamp cover switch

Make sure that the lamp cover is mounted correctly. If not or the lamp cover removed, the lamp does not light on for the safety. Check the lamp cover and lamp cover switch (SW901).



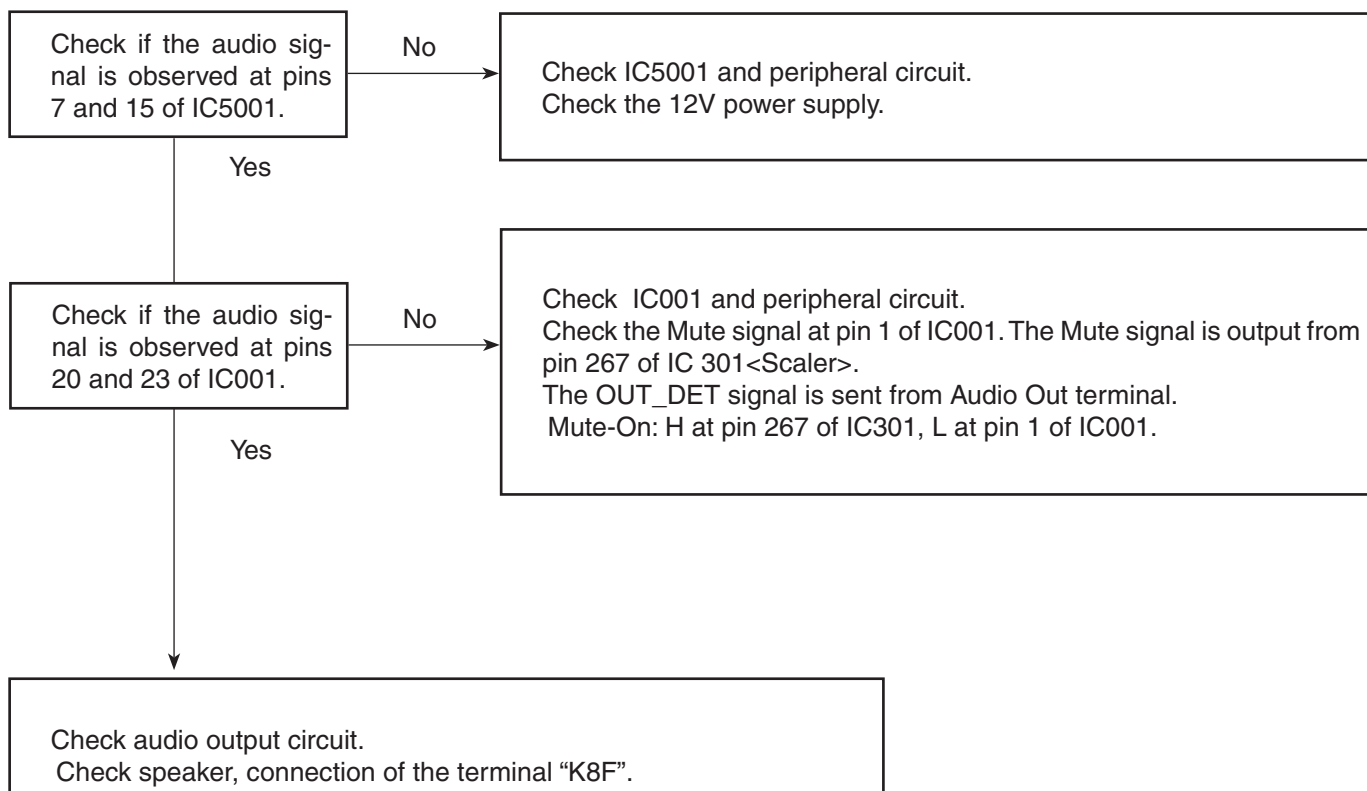
No picture

Check following steps.



No sound

Check following steps.

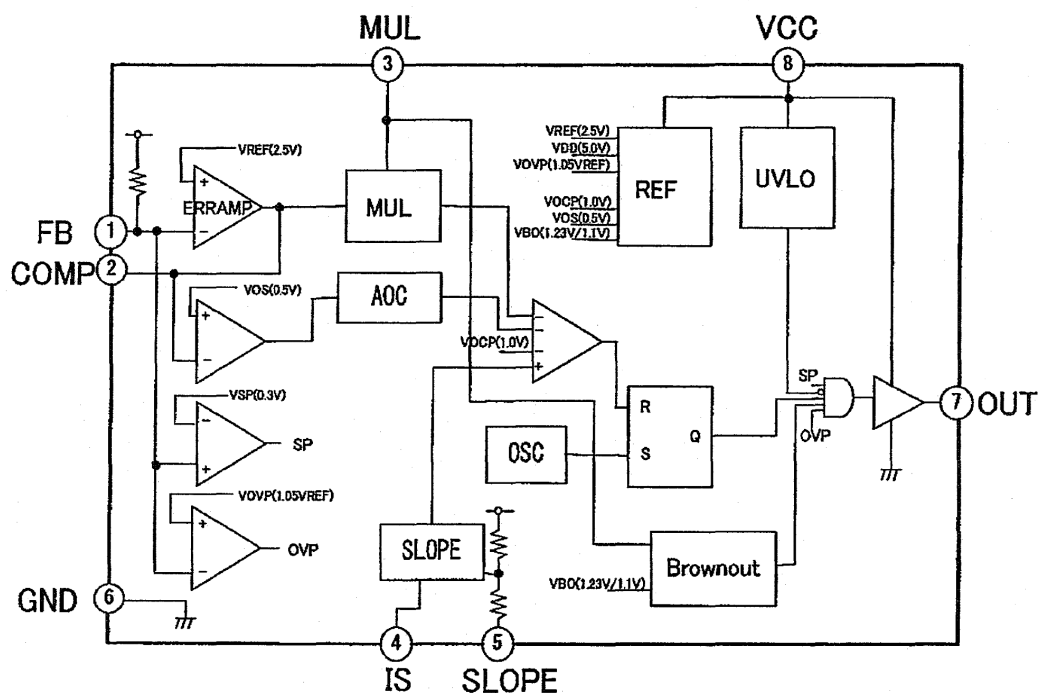


Control Port Functions

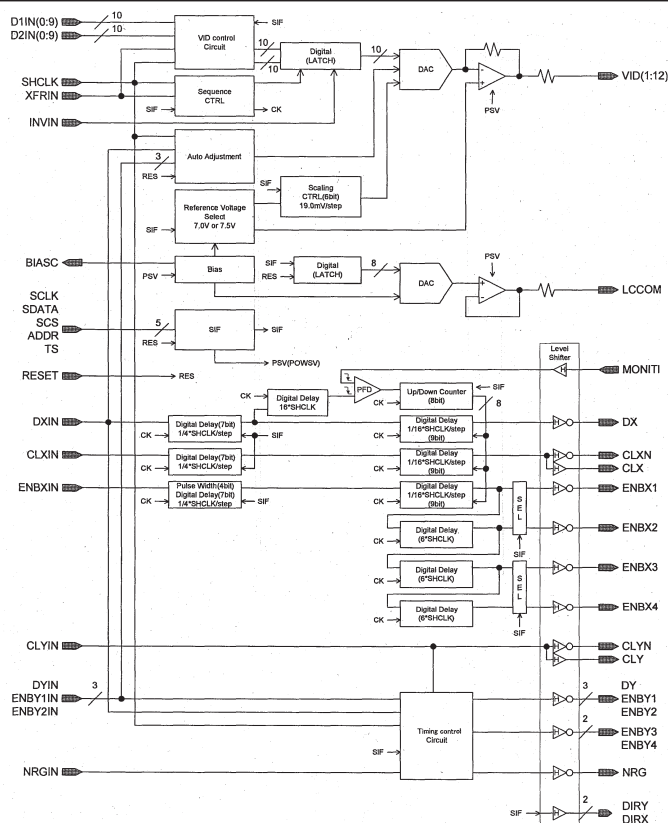
Scaler I/O port functions (PW190)

PIN NO.	PORT NO.	SIGNAL NAME	DESCRIPTION	I/O
2	A2	SIVS	HDMI V SYnc	I
11	A11	PW_UPDATE		O
26	A26	RXD_MCI	Network RXD	I
101	B2	DDC_SW		O
102	B3	SIHS	HDMI H Sync	I
124	B25	TXD_PW	Serial Control TXD	O
193	C3	SICLK	HDMI Clock	I
194	C4	SIAHS	HDMI H Sync	I
200	C10	LAMP_PWM	Lamp Control	O
202	C12	SDATA_PW	3-Wired Serial Control Data	O
204	C14	DCLK	Clock Output	O
206	C16	DVS	V Sync Output	O
208	C18	SDA2	IIC Bus Switch IC DAC, SoundIC[5V_SW]	O
211	C21	SCL1		O
212	C22	SDA0	IIC Bus Temp Sensor [S3.3V]	O
214	C24	R/C_PW	Remote Control Input	I
28	C26	KEY1	Input/Select/Keystone	I
98	D1	FAN_SW2	Fan Control Switch SW2	O
191	D2	PW_MASTER_SCK		O
285	D12	LAMP_DET	Lamp retry detect, High=Retry	I
288	D15	DHS	Horiz. Sync Output	O
290	D17	SCL2	IIC Bus Control Clock	O
293	D20	SCL0	IIC Bus Control Clock	O
294	D21	SDA1	IIC Bus Control Data	O
295	D22	TXD_MCI	Network TXD	O
215	D24	P_FAIL	Power Failure Signal Input, Failure:L	I
126	D25	KEY-2	Key Control Input	I
190	E2	FAN_SW1	Fan Control Switch SW1	O
275	E3	PW_MASTER_SDO	Sub CPU Communication	O
367	E19	SCLK_PW	3-Wired Serial Control Clock	O
368	E20	RXD_PW	Serial Control RXD	I
30	E26	FAN_CON_A	FAN_CON_A	O
96	F1	ON_16V	Standby Power Control 16V, S-5V	O
189	F2	PW_MASTER_SDI	Sub CPU Communication	I
420	F5	POWER_SW_LAN	Network Power SW	O
298	F23	Option SW	Option Switch	I
128	F25	FAN_CON_B	FAN_CON_B	O
95	G1	ON_150V	Standby Power Control 15V	O
188	G2	ON_33V	Standby Power Control 3.3V	O
273	G3	IRM_RST	Color Shading Reset	O
419	G5	ON_50V	Standby Power Control 5V	O
374	J22	FAN_CON_C	FAN_CON_C	O
347	K4	ON_18V	Standby Power Control 18V	O
184	L2	POW_KEY	Power On Key, H:ON	I
90	M1	HDMI_DET	HDMI Connection Detection	I
89	N1	LAMP_DC_ON	Power Control, Power On: H	O
267	N3	MUTE	High=MUTE_ON	O
344	N4	MONIT_OUT	Low=in, High=Monit OUT	O
413	N5	MODEL_OPTION	Option SW	I
474	N6	S_SW	S-Video Detection Input	I
265	R3	S_CHROMA	S-Video Chroma Input	I
86	T1	SOG2	Sync On Green Input 2	I
264	T3	S_Y	S-Video Y Input	I
263	U3	SOG1	Sync On Green Input 1	I
409	U5	SCART_CV	Y Input	I
262	V3	VIDEO	Video Input	I
82	Y1	R1	Red Input 1	I
260	Y3	G1	Green Input 1	I
174	AA2	G1	Sync Input 1	I
258	AB3	B1	Blue Input 1	I
172	AC2	R2	Red Input 2	I
331	AC7	HS1	Horiz Sync Input 1	I
78	AD1	G2	Green Input 2	I
256	AD3	B2	Blue Input 2	I
253	AD6	HS2	Horiz Sync Input 2	I
161	AE11	VS1	Vert. Sync Input 1	I
66	AF11	VS2	Vert. Sync Input 2	I

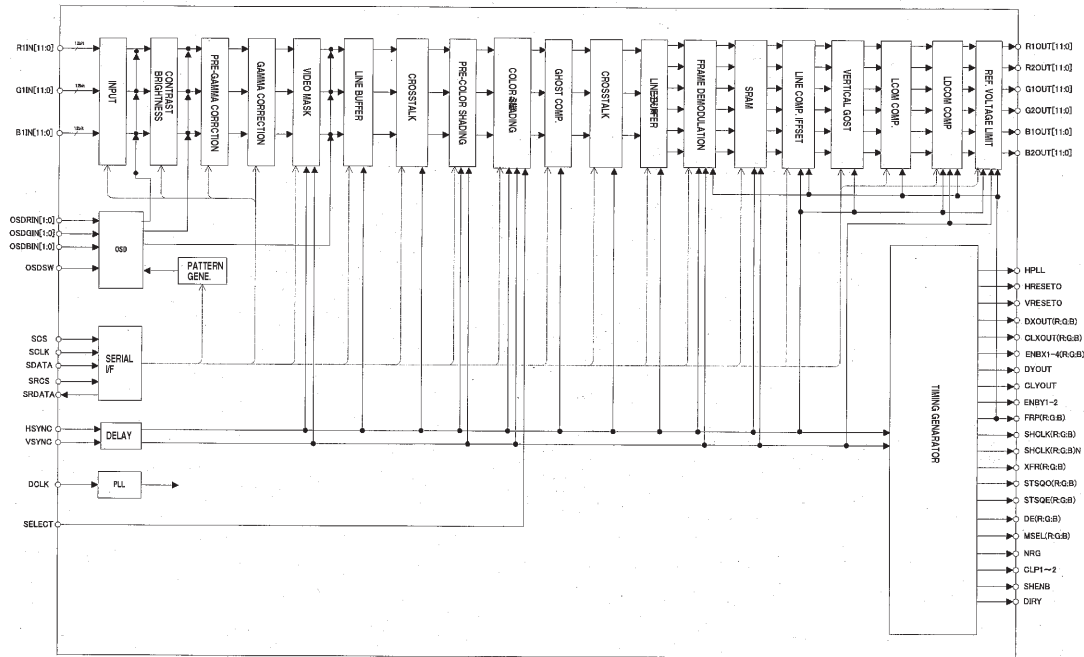
● FA5550NG <P.F. control, IC621>



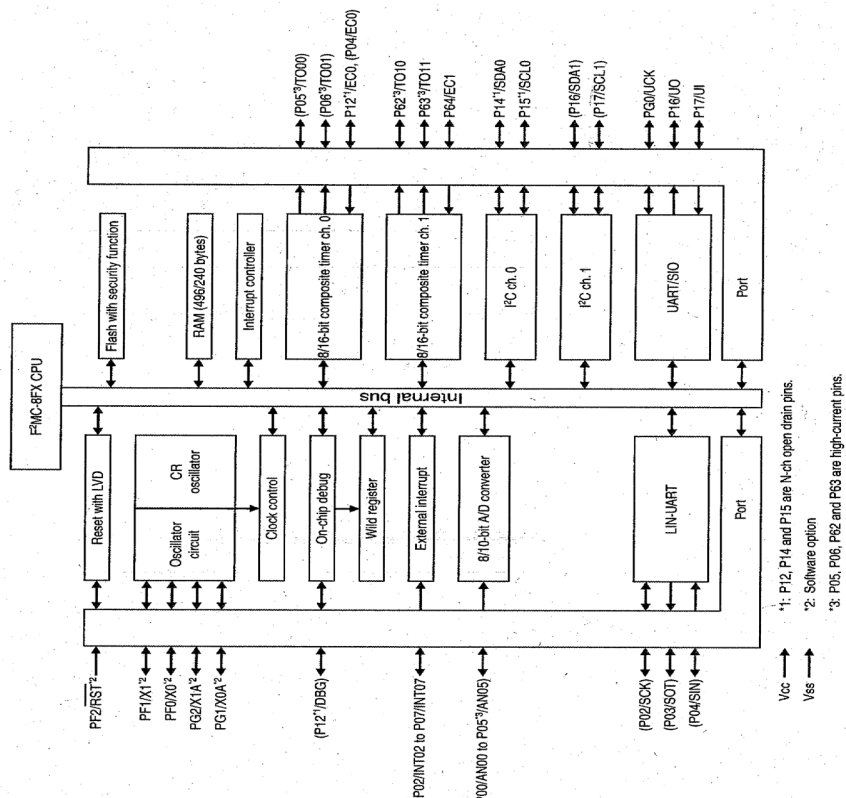
● L3E06200 <D/A, S/H-LCD Driver, IC501, IC531, IC561>



● L3E07111 <Digital Gamma and Driver, IC401>



● MB95F353EPFT <Sub CPU, IC9885>

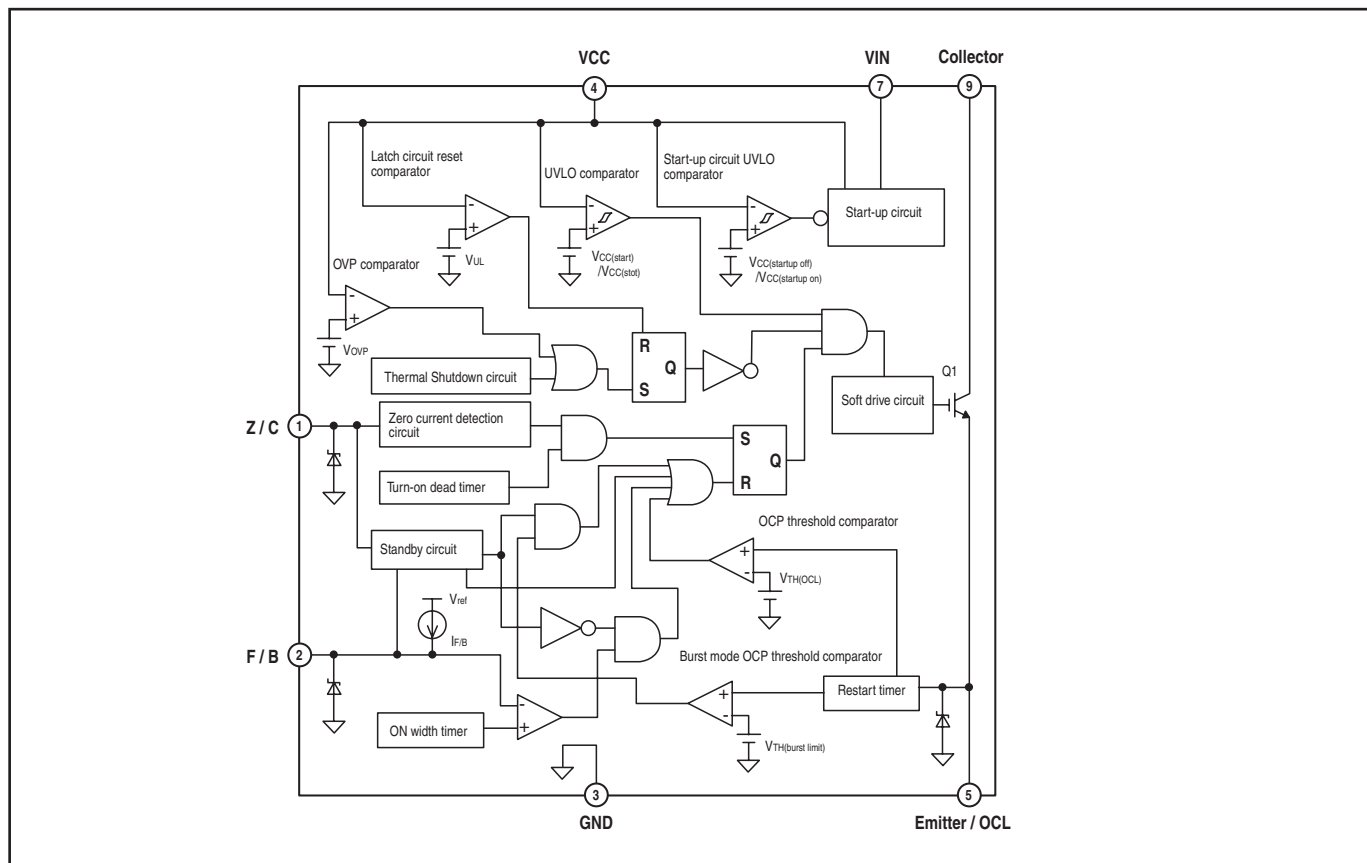


*1: P12, P14 and P15 are N-ch open drain pins.

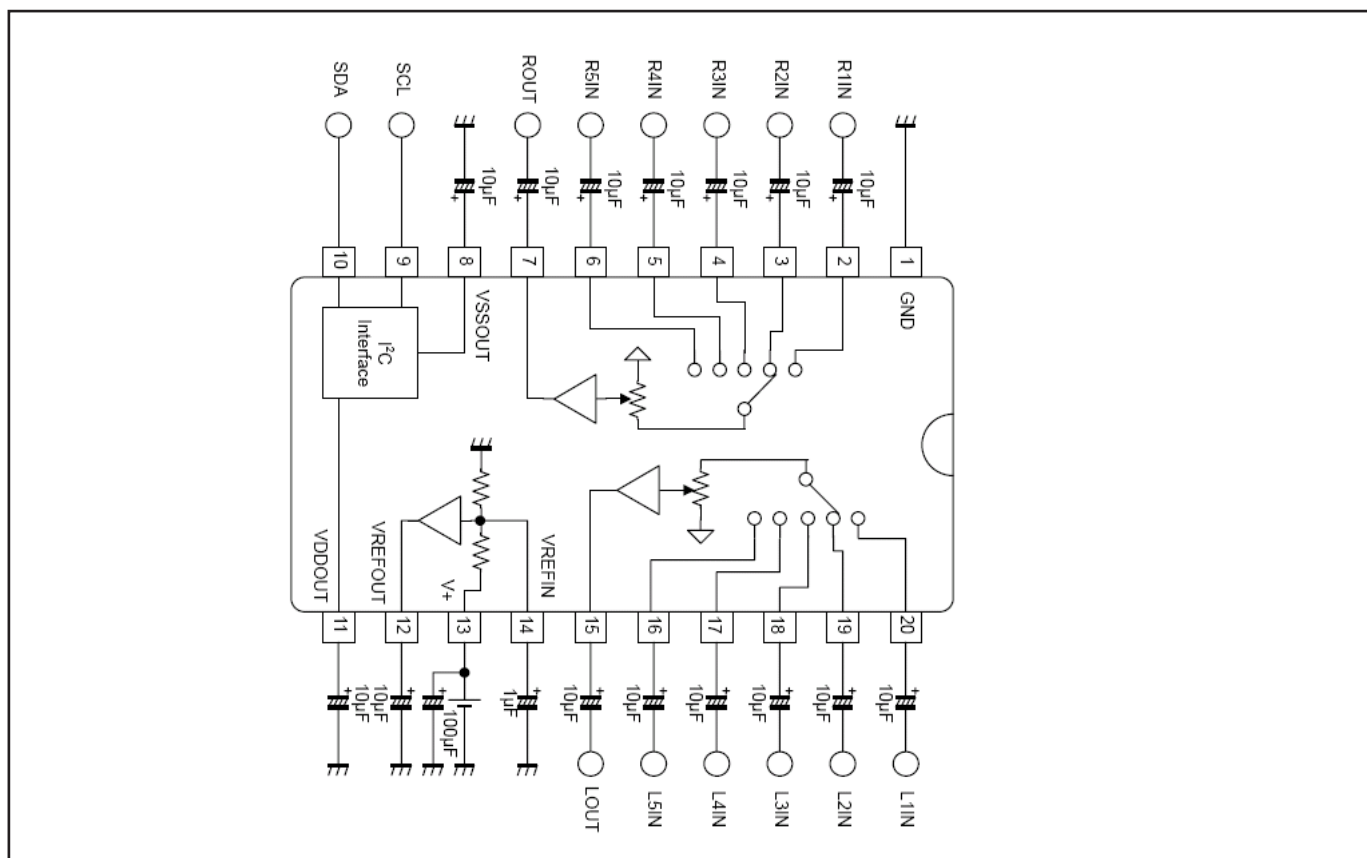
*2: Software option

*3: P05, P06, P62 and P63 are high-current pins.

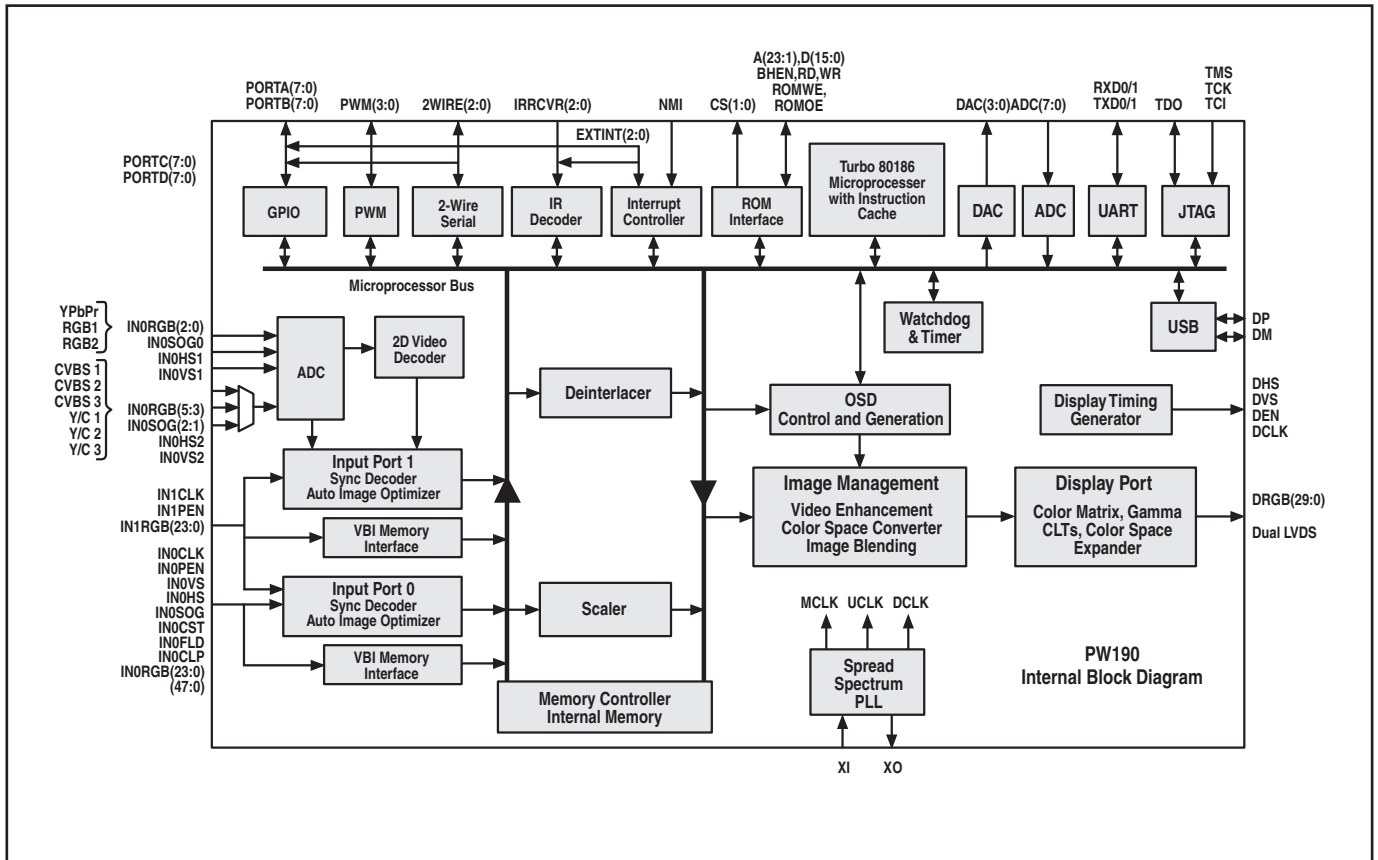
● MR4010 <Power OSC, IC631>



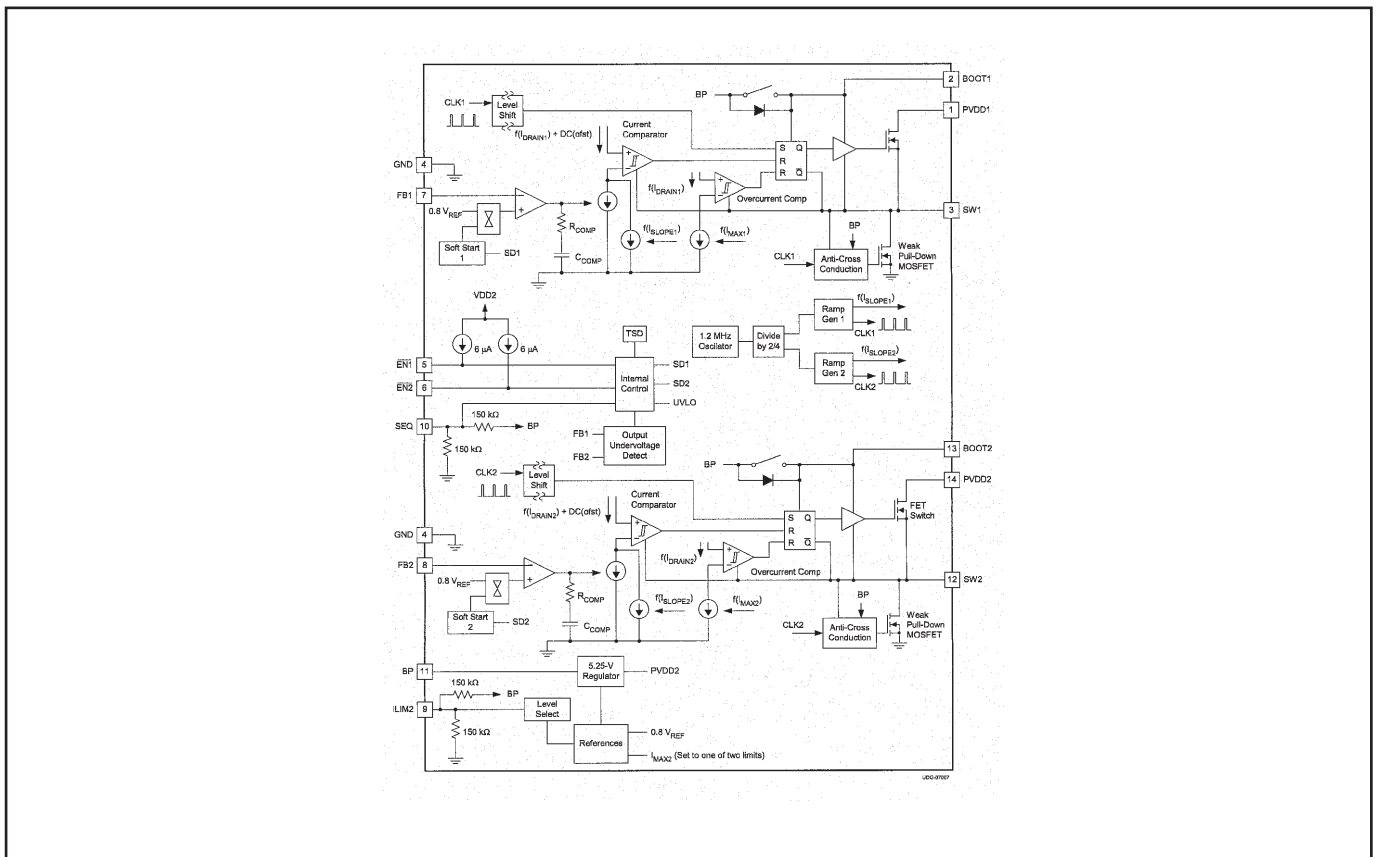
● NJW1156 <Audio Selector, IC5001>



● PW190 <Scaler, IC301>




● TPS54286 <DC-DC Converter, IC7811>



Exploded Views Parts List

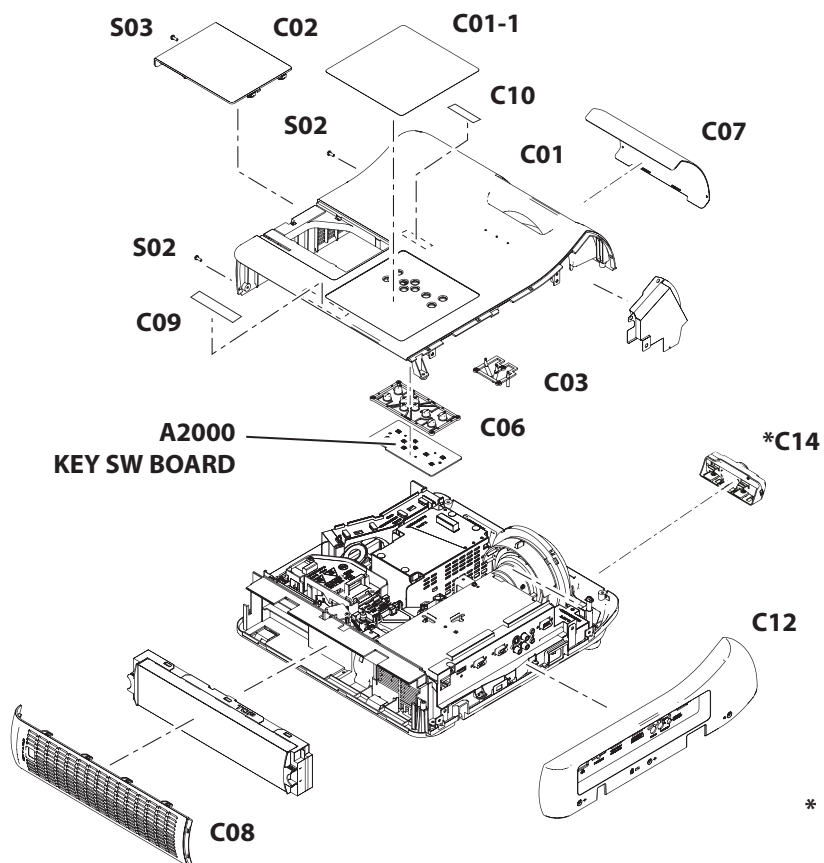
Models	PT-TW230U
	PT-TW230E
	PT-TW230EA
	PT-TW231RU
	PT-TW231RE
	PT-TW231REA

Important Safety Notice

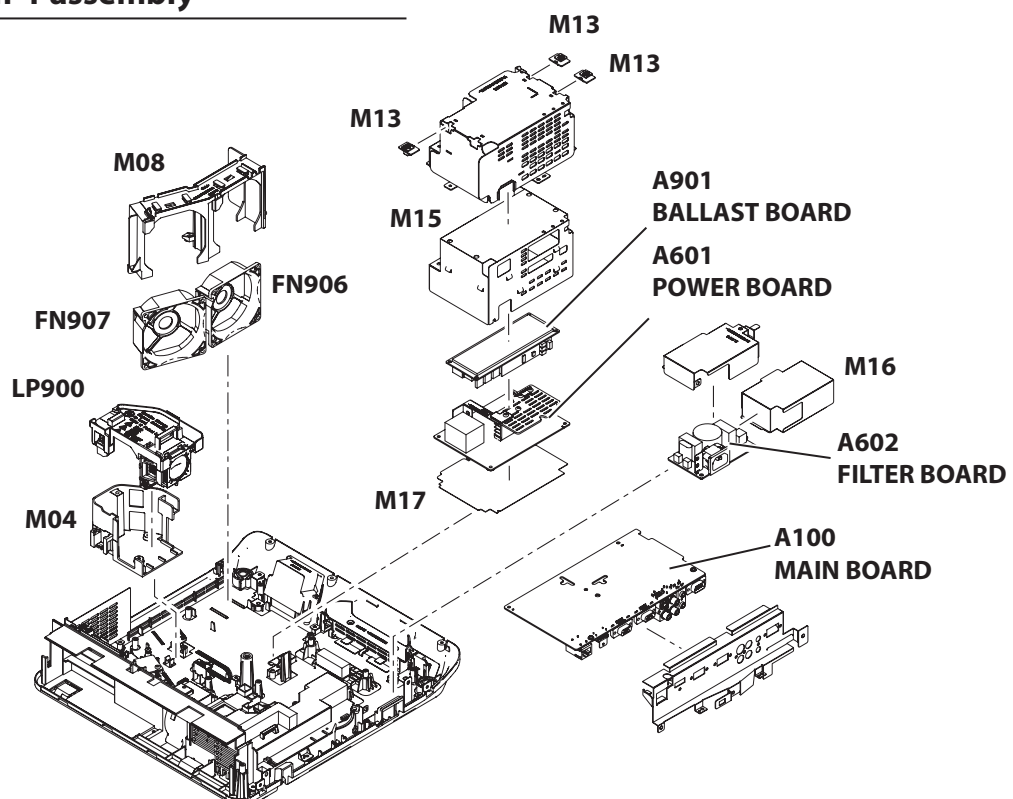
Components identified by the International symbol  have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

Before ordering the service parts, confirm the parts number with the Ref. No in the parts list and the exploded view.

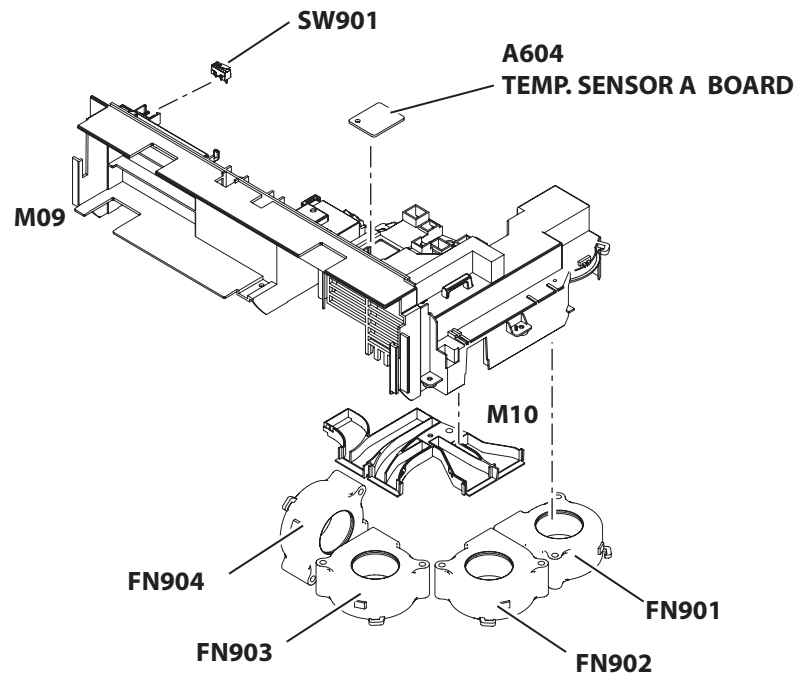
Cabinet top assembly



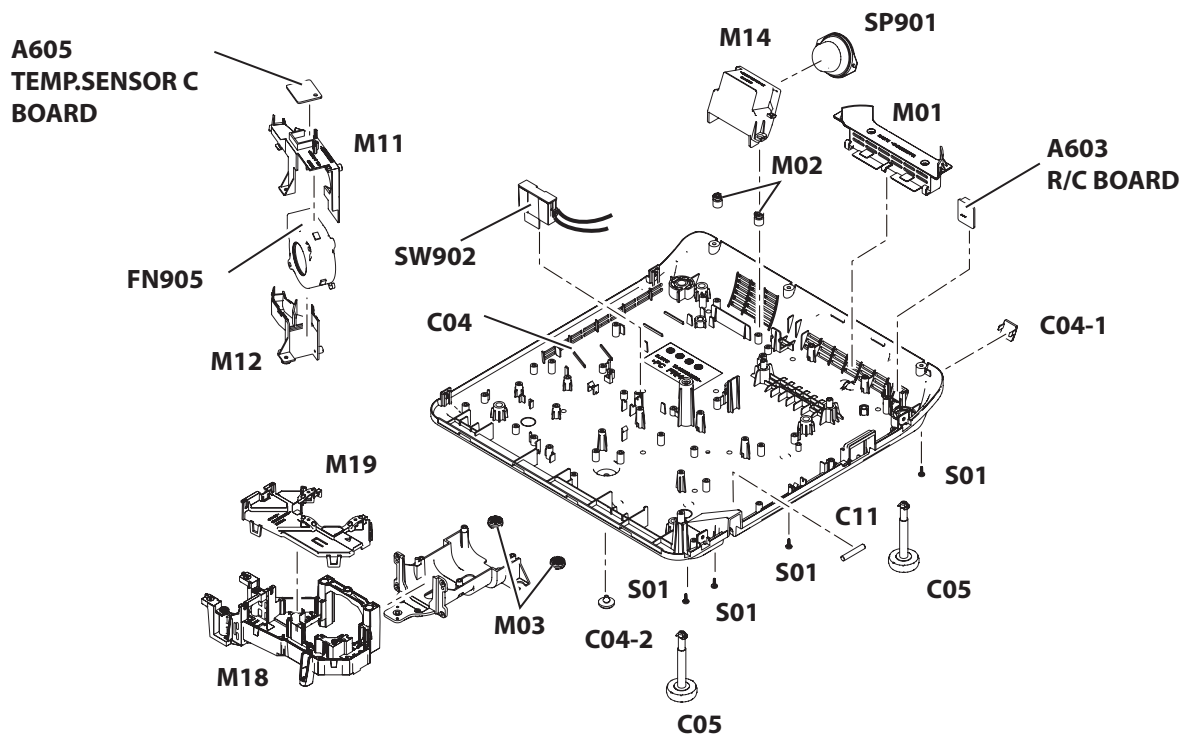
Cabinet bottom-1 assembly



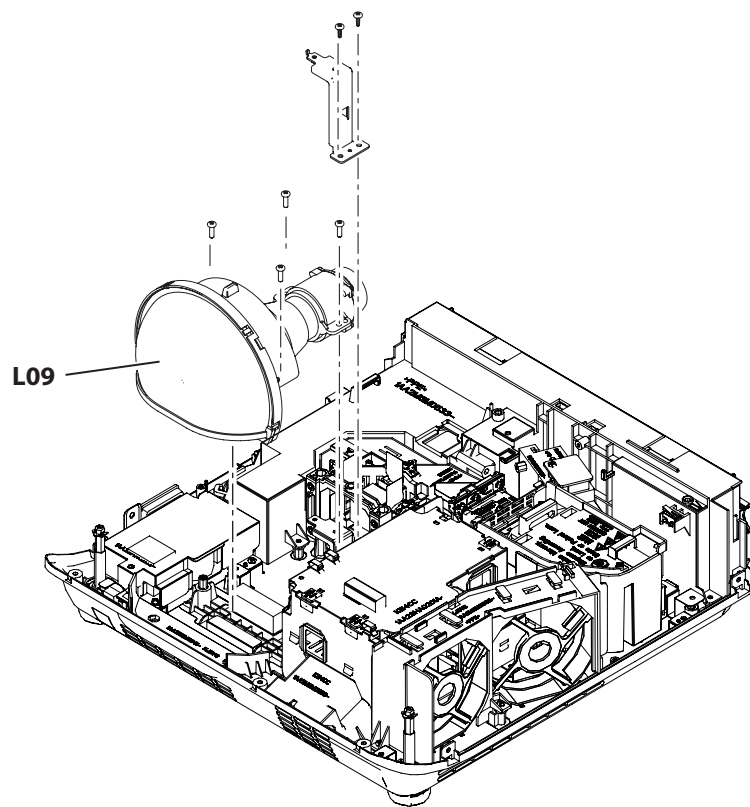
Filter duct assembly



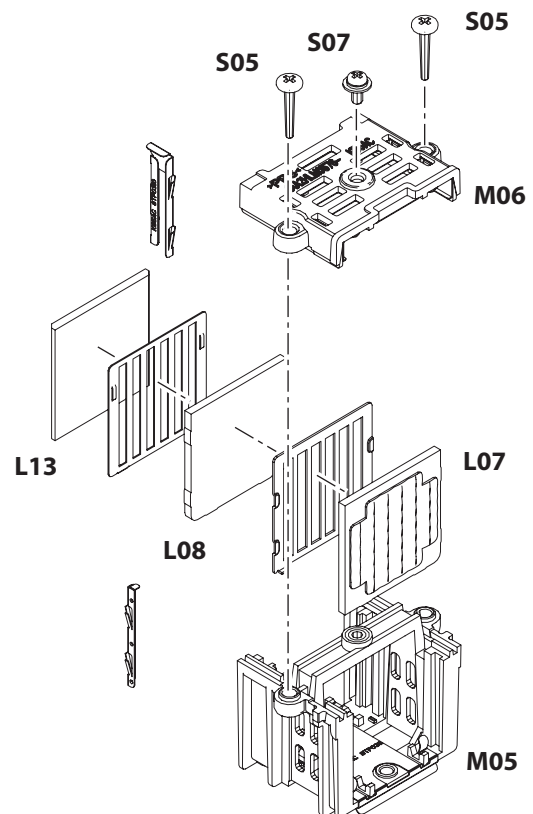
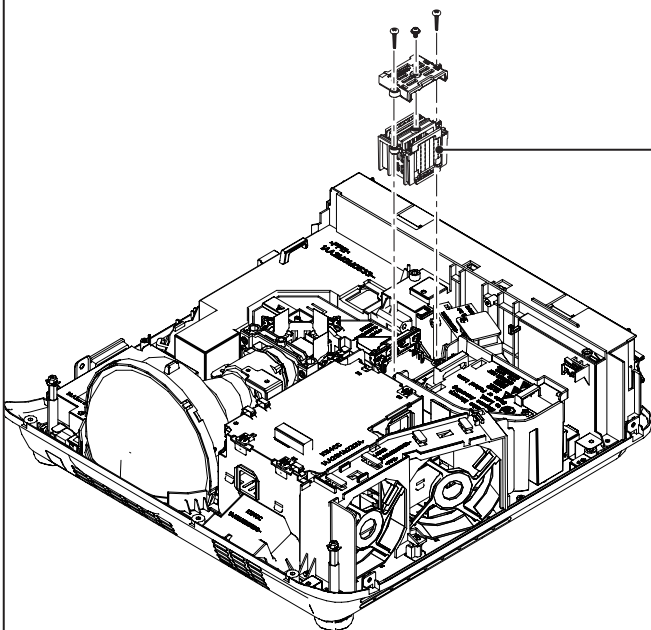
Cabinet bottom-2 assembly



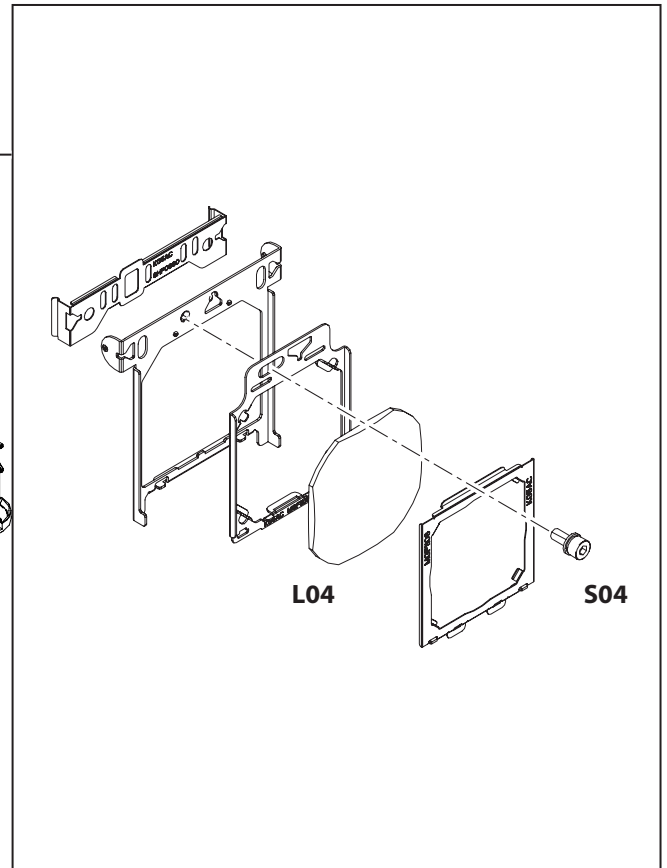
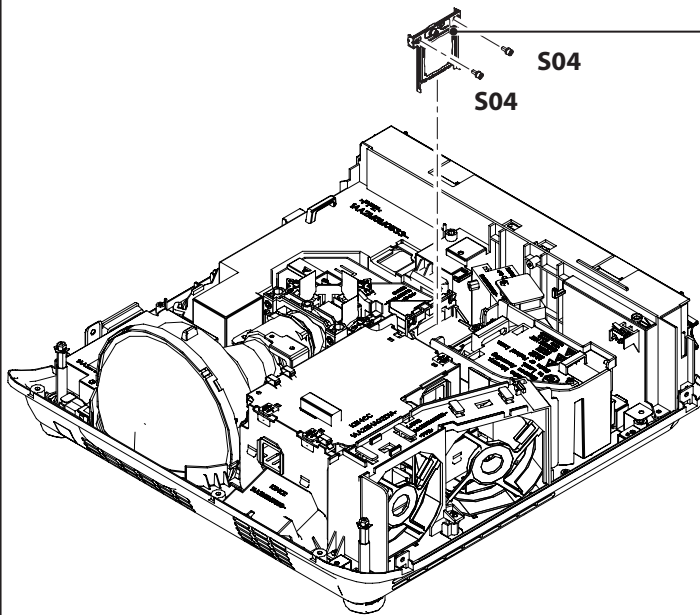
Projection Lens



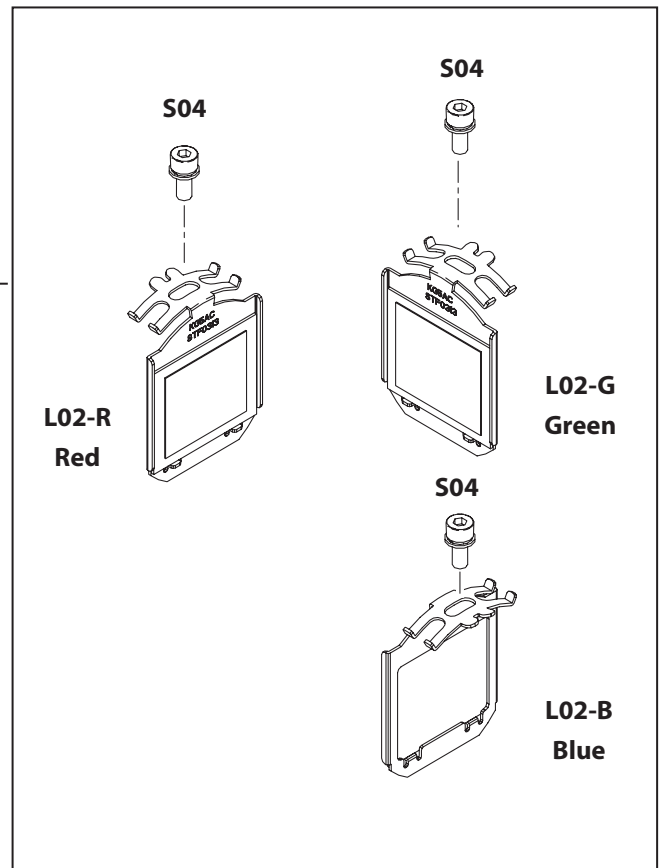
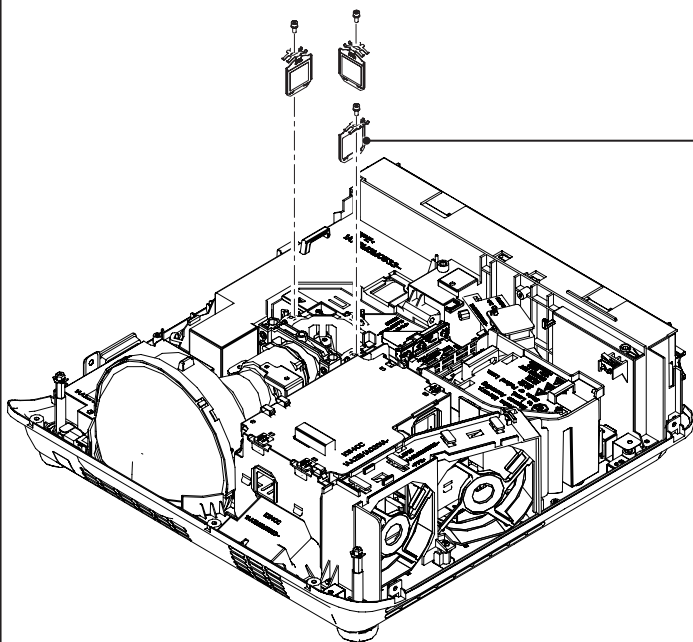
PBS and Integrator lens assembly



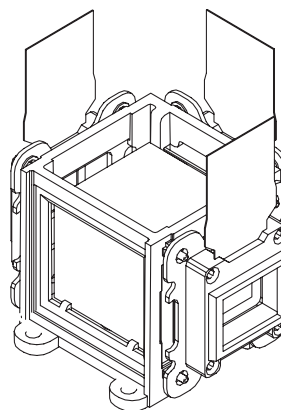
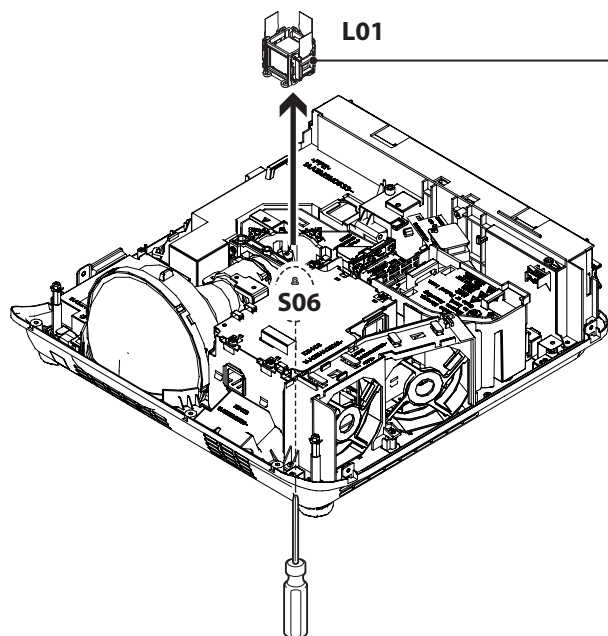
Condenser lens (OUT) assembly



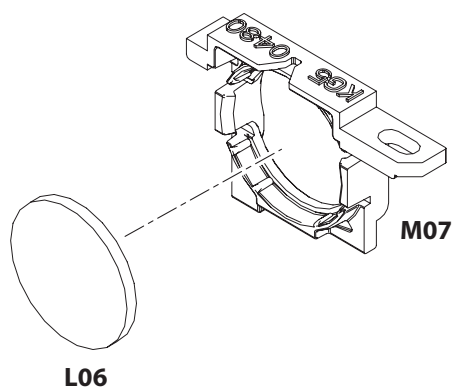
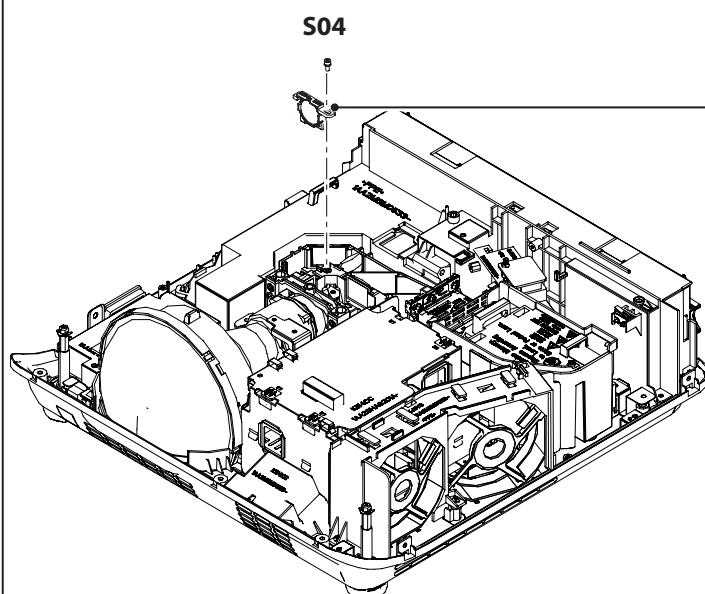
Polarized Glass (IN) assembly



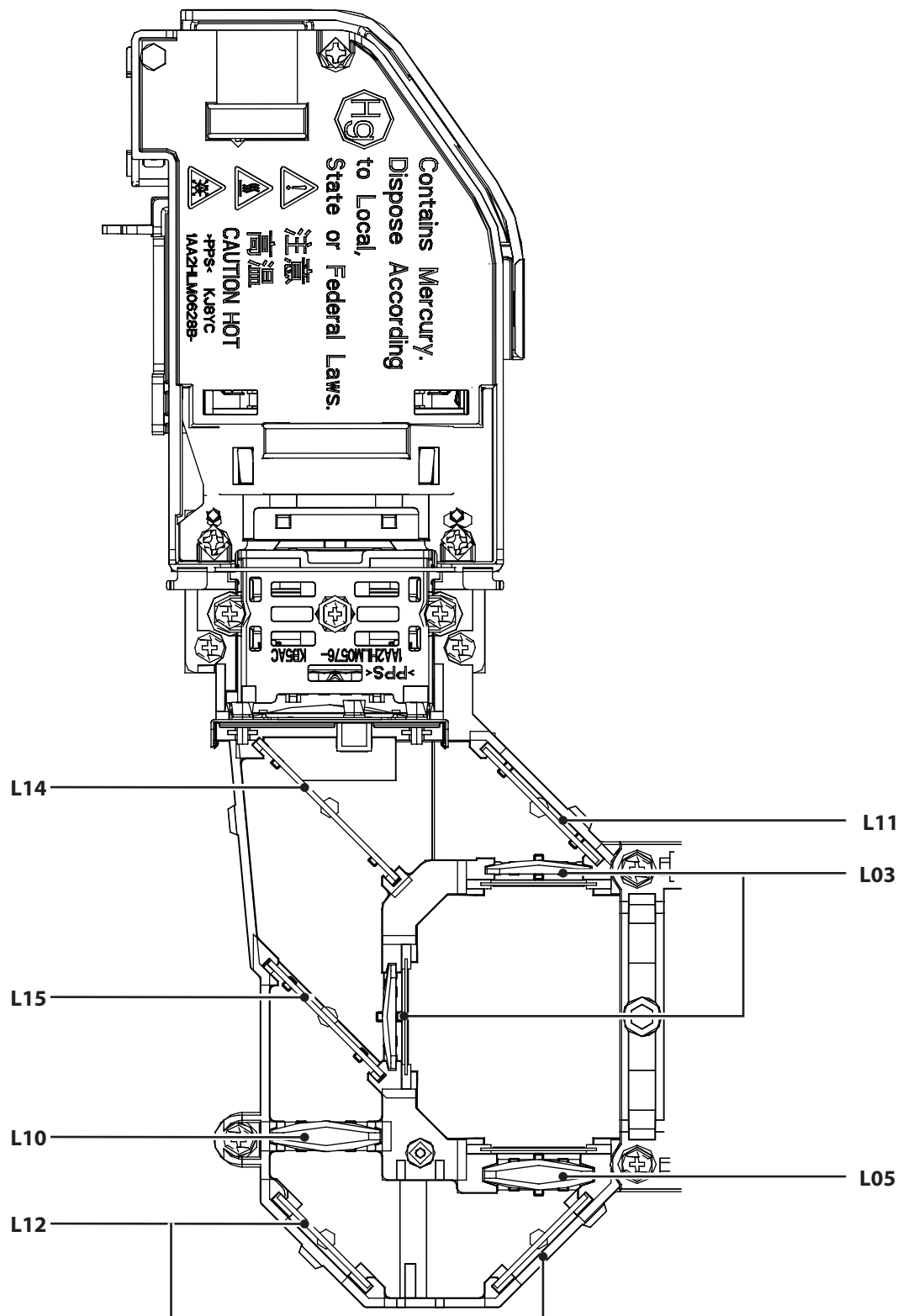
LCD Panel/Prism Assembly



Relay lens (OUT) assembly

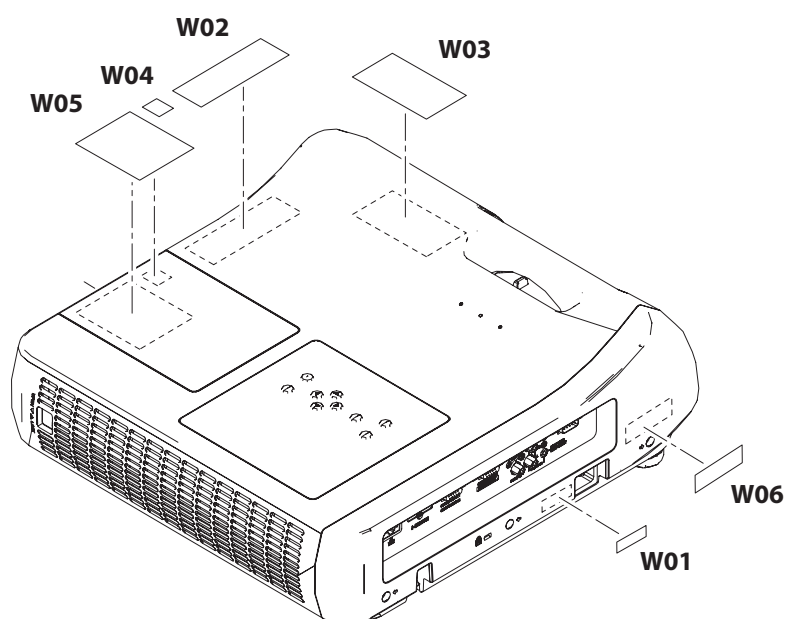


In the optical unit

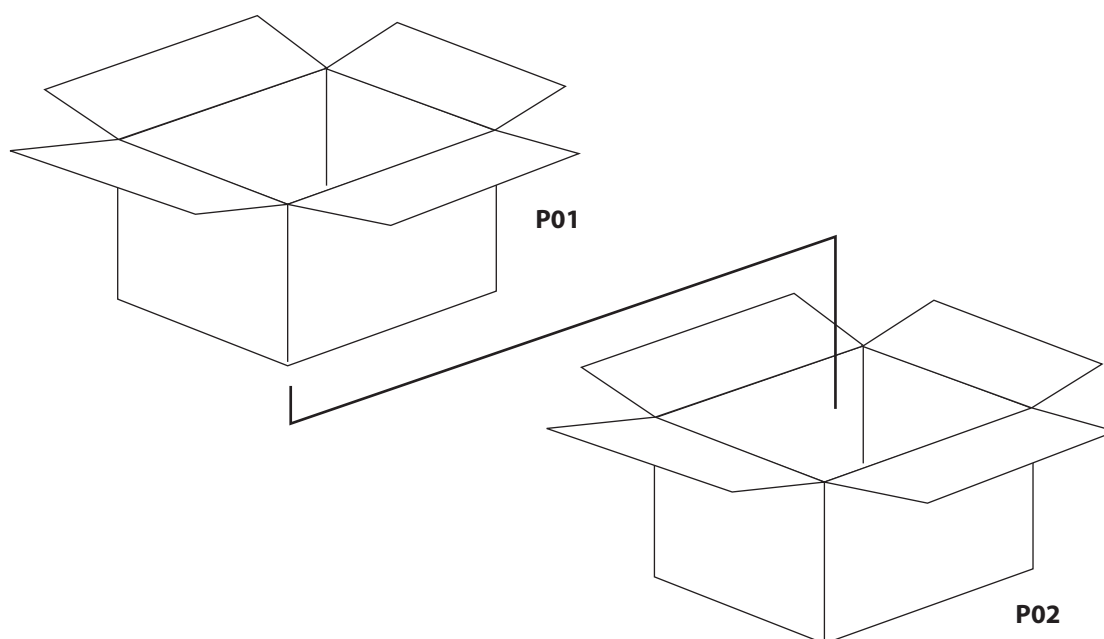
**CAUTION:**

Part must be placed in specified direction when replacing the optical parts. Please see "Optical parts disassembly" for further instructions.


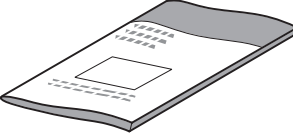

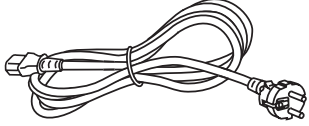
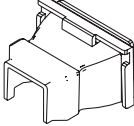

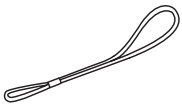
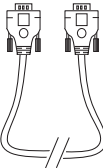
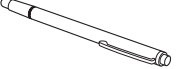




Labels



Packing



● Accessories (see accessories parts list)

REMOTE CONTROL	MANUALs	CD-ROMs
		
AC CORD	AC CORD HOLDER	AC CORD STOPPER
		
STRAP	VGA CABLE	
		
INTERACTIVE LIGHT PEN *1	INTERACTIVE PONTNER *1	INTERACTIVE USB CABLE *1
 (Not service parts) Product Model No. ET-PEN100	 (Not service parts) Product Model No. ET-PNT100	
CABLE HOLDER *1	FERRITE CORE *1	
		

*1 These parts are exclusive for model PT-TW231R series.

Mechanical Parts List

PT-TW230U / TW230E / TW230EA
PT-TW231RU / TW231RE / TW231REA

Key No. Part No. Description			Key No. Part No. Description		
PACKING MATERIALS					
P01	6103596242	CARTON CASE-KY4AC TW231RU	6550052124		SETUP INST-LW4AC TW230E/TW230EJ
	6103596259	CARTON CASE-LY4AC TW231RE/TW231REJ	6550052131		SETUP INST-LW45C TW230EA/TW230EAJ
	6103596266	CARTON CASE-LY45C TW231REA	6451053893		ASSY,REMOCON MXEJ
P02	6103596327	CARTON CASE OUTER-KY4AC TW231RU	6520032767		CORE,CLAMP TW231R
	6103596334	CARTON CASE OUTER-LY4DC TW231REJ	6451043719		CABLE,USB(CL-2) TW231R
	6103596341	CARTON CASE OUTER-LY4CC TW231REAJ	6103547107		FIXER BTM-KJ8AE TW231R
P01	6103596174	CARTON CASE-KW4AC TW230U			
	6103596181	CARTON CASE-LW4AC TW230E/TW230EJ			
	6103596198	CARTON CASE-LW45C TW230EA/TW230EAJ			
P02	6103596280	CARTON CASE OUTER-KW4AC TW230U			
	6103596297	CARTON CASE OUTER-LW4DC TW230EJ			
	6103596303	CARTON CASE OUTER-LW4CC TW230EAJ			
	6103469249	POLY BAG			
	6103498638	CASE ACCESSORY-KJ8YC			
	6103547039	CUSHION TOP-KJ8AE			
	6103547091	CUSHION BTM-KJ8AE			
LABELS			MECHANICAL PARTS		
⚠ W01	6103575711	LABEL,AC U-KA2JC	CABINET PARTS		
⚠ W02	6103601038	LABEL CAUTION HOT 5-KW4AC	⚠ C01	6103595665	CABINET TOP SERVIEC-KW4AC
⚠ W03	6103601120	LBL,CAUTION LNS 5-KW4AC	C01-1	6103592374	DEC CONTROL SHEET-KW4CC
⚠ W04	6103601915	LABEL,CAUTION UV-KW4AC	⚠ C02	6103592282	ASSY COVER LMP-KW4CC
⚠ W05	6103603490	LBL,LMP U230W HI-HG-GL S5-KW4A	C03	6103490083	DEC INLAY LED-KJ8YC
⚠ W06	6103601014	LABEL CAUTION EARTH 3-KW4AC TW231RE/TW231REJ/ TW231REA/TW231REAJ TW230E/TW230EJ/ TW230EA/TW230EAJ	⚠ C04	6103595689	CABINET BTM SERVICE-KW4AC
			C04-1	6103490090	DEC INLAY RC-KJ8YC
			C04-2	6103468495	DEC LEG-KA8AL
			C05	6103592350	ASSY STAND LEG-KW4CC
			C06	6103592336	BUTTON CONTROL-KW4CC
			C07	6103490106	CAP LNS-KJ8YC
			C08	6103592343	COVER FLT(A)-KW4CC
			C09	6103595559	DEC SHEET FEATURE-KY4AC TW231R Series
				6103595535	DEC SHEET FEATURE-KW4AC TW230 Sereis
			C10	6103595597	DEC SHEET NUMBER-KY4AC TW231R Series
				6103595573	DEC SHEET NUMBER-KW4AC TW230 Series
			C11	6103490199	MOUNT LOCK-KJ8YC
			C12	6103592329	PANEL AV-KW4CC
			C14	6451055200	UNIT,INTERACTIVE MODULE TW231R Series
			CHASSIS PARTS		
			M01	6103496276	DEC LNS-KJ8YC
			M02	6103324746	BUSH-KK6A
			M03	6103490830	BUSH -KJ8AC
			⚠ M04	6103490212	HOLDER LMP HOUSE-KJ8YC
			⚠ M05	6103569536	HOLDER INT PBS BTM-KJ8YC
			M06	6103569543	HOLDER INT PBS TOP-KJ8YC
			M07	6103567372	MTG RELAY OUT(A)-KG5AC
			M08	6103520377	MTG EXHAUST FN-KJ8YC
			M09	6103531038	MOUNTING DUCT PNL TOP-KJ8YC
			M10	6103531045	MOUNTING DUCT PNL BTM-KJ8YC
			M11	6103531014	MOUNTING DUCT LMP TOP-KJ8YC
			M12	6103490274	MOUNTING DUCT LMP BTM-KJ8YC
			M13	6103603735	MTG BALLAST PWB-KA4AC
			M14	6103592381	MTG SP-KW4CC
			⚠ M15	6103595627	SPACER SHEET POWER TOP-KW4AC
			⚠ M16	6103595634	SPACER SHEET FILTER-KW4AC
			⚠ M17	6103599694	SPACER_SHEET_POWER_BTM_KW4AC
			⚠ M18	6103534442	OPTICAL BASE BTM-KA2AC
			M19	6103533759	OPTICAL BASE TOP(A)-KG5AC
			SCREWS		
			S01	4111798801	SCR S-TPG BIN 3X10
			S02	4110319304	SCR BIN 3X8
			S03	4120779105	SPECIAL SCREW
			S04	4120778108	SPECIAL SCREW-2.5X6
			S05	4111898303	SCR BIN 3X14
			S06	3120703400	SPECIAL SCREW-3.0X10V
			S07	4111925108	SCR PAN+SW+W 2.5X6
ACCESSORIES					
⚠ US	6103580425	COMPL, VGA CABLE-KC2JC			
⚠ EU	6103581217	COMPL AC CORD KE4AC			
⚠ UK	6103580203	COMPL, AC CORD-LC2JC			
	6103580210	COMPL, AC CORD-LC2LC			
	6103504711	STRAP CAP-KJ8YC			
	6103592442	HOLDER AC LOCK-KW4CC			
	6103592466	STOPPER AC LOCK-KW4CC			
	6103597300	CD-ROM(ED INTERACTIVE CD)			
	6103589343	CD-ROM,OWNERS MANUAL-KY4AC TW231R Series			
	6550052162	SETUP INST-KY4AC TW231RU			
	6550052179	SETUP INST-LY4AC TW231RE/TW231REJ			
	6550052186	SETUP INST-LY45C TW231REA/TW231REAJ			
	6103589312	CD-ROM,OWNERS MANUAL-KW4AC TW230 Series			
	6550052117	SETUP INST-KW4AC TW230U			

Mechanical Parts List

Key No.	Part No.	Description	Key No.	Part No.	Description
OPTICAL PARTS					
L01	6103563503	ASSY,PNL/PSM-KJ8YF			
L02-R	6103465562	ASSY,POL R IN-KG5AC			
L02-G	6103557571	ASSY, POLG IN-KJ8YC			
L02-B	6103465548	ASSY,POL B IN-KD5AC			
L03	6450964657	LENS,CONDENSER(G)			
L04	6450990564	LENS,CONDENSER(OUT)			
L05	6450990571	LENS,RELAY(IN)			
L06	6450990601	LENS,RELAY(OUT)			
L07	6450999161	LENS,INTEGRATOR(IN)			
L08	6450999178	LENS,INTEGRATOR(OUT)			
L09	6451023902	LENS,PROJECTION			
L10	6451029980	LENS,RELAY(IN)			
L11	6451010247	MIRROR(B)			
L12	6451010254	MIRROR(R)			
L13	6451053428	PRISM(PBS)			
L14	6451046918	DICHROIC MIRROR (B)			
L15	6451046895	DICHROIC MIRROR (G)			

Product safety should be considered when a component replacement is made in any area of a projector.
Components indicated by a \triangle mark in this parts list and the circuit diagram show components whose value have special significance to product safety. It is particularly recommended that only parts specified on the following parts list be used for components replacement pointed out by the mark.

● Read Description in the parts list

Read description in the Capacitor and Resistor as follows:

CAPACITOR	CERAMIC	100P	K	50V	
					Rated Voltage
					Tolerance Symbols:
					Less than 10pF
					A : Not specified B : $\pm 0.1\text{pF}$ C : $\pm 0.25\text{pF}$
					D : $\pm 0.5\text{pF}$ E : $\pm 0.1\text{pF}$ F : $\pm 1\text{PF}$
					G : $\pm 2\text{pF}$ H : $\pm 0.1 -0\text{pF}$ L : $\pm 0 -0.1\text{pF}$
					R : $\pm 0.25 -0\text{pF}$ S : $\pm 0 -0.25\text{pF}$
					More than 10pF
					A : Not specified B : $\pm 0.1\%$ C : $\pm 0.25\%$
					D : $\pm 0.5\%$ F : $\pm 1\%$ G : $\pm 2\%$
					H : $\pm 3\%$ J : $\pm 5\%$ K : $\pm 10\%$
					L : $\pm 15\%$ M : $\pm 20\%$ N : $\pm 30\%$
					P : $\pm 100-0\%$ Q : $\pm 30-10\%$ T : $\pm 50-10\%$
					U : $\pm 75-10\%$ V : $\pm 20-10\%$ W : $\pm 100-10\%$
					X : $\pm 40-20\%$ Y : $\pm 150-10\%$ Z : $\pm 80-20\%$
					Rated value: P=pico farad, U=micro farad
					Material:
					CERAMIC..... Ceramic
					MT-PAPER..... Metallized Paper
					POLYESTER..... Polyester
					MT-POLYEST.....Metallized Polyester
					POLYPRO..... Polypropylene
					MT-POLYPRO.....Metallized Polypropylene
					COMPO FILM..... Composite film
					MT-COMPO.....Metallized Composite
					STYRENE..... Styrene
					TA-SOLID..... Tantalum Oxide Solid Electrolytic
					AL-SOLID..... Aluminium Solid Electrolytic
					ELECT..... Aluminum Foil Electrolytic
					NP-ELECT.....Non-polarised Electrolytic
					OS-SOLID..... Aluminium Solid with Organic Semiconductive Electrolytic
					POS-SOLID..... Polymerized Organic Semiconductive
					DL-ELECT..... Double Layered Electrolytic
					PPS-FILM.....Polyphenylene Sulfide Film
					MT-PPS-FILM.....Metalized Polyphenylene Sulfide Film
					MT-PEN-FILM.....Metalized Polyethylenenaphthalate Film
					CAPACITOR.....Other

RESISTOR	CARBON	4.7K	J	A	1/4W	
						Rated Wattage
						Performance Symbols:
						A: General B: Non flammable Z: Low noise
						Other: Temperature coefficient
						T: $\pm 10\text{ppm}/^{\circ}\text{C}$ U: $\pm 25\text{ppm}/^{\circ}\text{C}$ C: $\pm 50\text{ppm}/^{\circ}\text{C}$
						D: $\pm 100\text{ppm}/^{\circ}\text{C}$ E: $\pm 200\text{ppm}/^{\circ}\text{C}$ F: $\pm 250\text{ppm}/^{\circ}\text{C}$
						G: $\pm 350\text{ppm}/^{\circ}\text{C}$ H: $\pm 1000\text{ppm}/^{\circ}\text{C}\pm 10\%$ W: $\pm 1200\text{ppm}/^{\circ}\text{C}\pm 10\%$
						Y: $\pm 1400\text{ppm}/^{\circ}\text{C}\pm 10\%$ J: $\pm 2000\text{ppm}/^{\circ}\text{C}\pm 10\%$ K: $\pm 2400\text{ppm}/^{\circ}\text{C}\pm 10\%$
						L: $\pm 2700\text{ppm}/^{\circ}\text{C}\pm 10\%$ M: $\pm 3000\text{ppm}/^{\circ}\text{C}\pm 10\%$ N: $\pm 3300\text{ppm}/^{\circ}\text{C}\pm 10\%$
						P: $\pm 3600\text{ppm}/^{\circ}\text{C}\pm 10\%$ Q: $\pm 3900\text{ppm}/^{\circ}\text{C}\pm 10\%$ R: $\pm 4200\text{ppm}/^{\circ}\text{C}\pm 10\%$
						S: $\pm 4300\text{ppm}/^{\circ}\text{C}\pm 10\%$ V: $\pm 4500\text{ppm}/^{\circ}\text{C}\pm 10\%$ X: $\pm 8000\text{ppm}/^{\circ}\text{C}\pm 10\%$
						Tolerance Symbols:
						A: $\pm 0.05\%$ B: $\pm 0.1\%$ C: $\pm 0.25\%$ D: $\pm 0.5\%$
						F: $\pm 1\%$ G: $\pm 2\%$ J: $\pm 5\%$ K: $\pm 10\%$
						M: $\pm 20\%$ P: $\pm 5-15\%$ Z: 0 ohm
						Rated value, ohms:
						K: 1,000, M: 1,000,000
						Material:
						CARBON..... Carbon
						MT-FILM..... Metal Film
						OXIDE-MT..... Oxide Metal Film
						SOLID..... Composition
						MT-GLAZE..... Metal Glaze
						WIRE WOUND...Wire Wound
						CERAMIC RES.. Ceramic
						FUSIBLE RES....Fusible
						RESISTOROther

Electrical Parts List

Key No.	Part No.	Description	Key No.	Part No.	Description
ASSEMBLIED BOARDS					
△ A100	6550051936	ASSY,PWB,MAIN, KY4CC For PT-TW231R Series	C1011	3034420519	CERAMIC 0.068U K 16V
△ A100	6550051684	ASSY,PWB,MAIN, KW4CC For PT-TW230 Series	C1012	3034093426	CERAMIC 0.1U K 16V
△ A200	6550051899	ASSY,PWB,KEY_SW KW4CC	C1014	3034420519	CERAMIC 0.068U K 16V
△ A601	6550051707	ASSY,PWB,POWER KW4CC	C1016	3034420519	CERAMIC 0.068U K 16V
△ A602	6550051714	ASSY,PWB,FILTER KW4CC	C1017	3034420519	CERAMIC 0.068U K 16V
△ A603	6550051721	ASSY,PWB,R/C KW4CC	C1018	3034420519	CERAMIC 0.068U K 16V
△ A604	6550051738	ASSY,PWB,TEMP. SENSOR A KW4CC	C1019	3034093426	CERAMIC 0.1U K 16V
△ A605	6550051745	ASSY,PWB,TEMP. SENSOR C KW4CC	C1049	3034093426	CERAMIC 0.1U K 16V
ELECTRICAL PARTS			C1061	3033983312	ELECT 47U M 10V
△ A901	6451024770	UNIT,BALLAST	C1092	3033583215	CERAMIC 10U K 6.3V
△ A901A	6103454276	CABLE,BALLAST KR5AC	C1103	3034093426	CERAMIC 0.1U K 16V
△ FN901	6451030702	MOTOR,BLW DC 3.96W	C1105	3034093426	CERAMIC 0.1U K 16V
△ FN902	6451030696	MOTOR,BLW DC 3.96W	C1331	3032761911	CERAMIC 22P J 50V
△ FN903	6451030702	MOTOR,BLW DC 3.96W	C1332	3033092519	CERAMIC 27P J 50V
△ FN904	6451030696	MOTOR,BLW DC 3.96W	C1371	3034093426	CERAMIC 0.1U K 16V
△ FN905	6451030702	MOTOR,BLW DC 3.96W	C1871	3034331112	CERAMIC 1U K 10V
△ FN906	6451030689	MOTOR,FAN DC 5.28W	C2001	3034093426	CERAMIC 0.1U K 16V
△ FN907	6451030689	MOTOR,FAN DC 5.28W	C2002	3033983312	ELECT 47U M 10V
K10A1	3120730406	SPECIAL SCREW	C2003	3033921215	ELECT 47U M 6.3V
K10A2	3120730406	SPECIAL SCREW	C2025	3033727510	CERAMIC 2.2U K 6.3V
K10B1	3120730406	SPECIAL SCREW	C2026	3034331112	CERAMIC 1U K 10V
K10B2	3120730406	SPECIAL SCREW	C2031	3032946110	CERAMIC 100P J 50V
K40B1	3120730406	SPECIAL SCREW	C2041	3032946110	CERAMIC 100P J 50V
K40B2	3120730406	SPECIAL SCREW	C2891	3034093426	CERAMIC 0.1U K 16V
L901	9520019431	CORE,CLAMP	C2892	3033058812	CERAMIC 47P J 50V
L902	6520031098	CORE,CLAMP	C2893	3034093426	CERAMIC 0.1U K 16V
SP901	6520032699	SPEAKER,8	C2894	3034093426	CERAMIC 0.1U K 16V
SW901	9450560751	SWITCH,MICRO 1P-2T	C301	3034093426	CERAMIC 0.1U K 16V
△ SW902	6520037397	ASSY,WIRE-SW902	C302	3033583215	CERAMIC 10U K 6.3V
△ Z8I&6S	6520035034	ASSY,WIRE	C303	3032825118	CERAMIC 470P K 50V
△ Z8L&6L	6520035010	ASSY,WIRE	C304	3034093426	CERAMIC 0.1U K 16V
△ A100	6550051936	ASSY,PWB,MAIN, KY4CC For PT-TW231R Series	C306	3034093426	CERAMIC 0.1U K 16V
△ A100	6550051684	ASSY,PWB,MAIN, KW4CC For PT-TW230 Series	C307	3032825118	CERAMIC 470P K 50V
C001	4034670911	CERAMIC 0.1U K 25V	C308	3034093426	CERAMIC 0.1U K 16V
C002	4034549217	CERAMIC 0.47U K 25V	C309	3034093426	CERAMIC 0.1U K 16V
C005	4034549217	CERAMIC 0.47U K 25V	C310	3033583215	CERAMIC 10U K 6.3V
C006	4034670911	CERAMIC 0.1U K 25V	C311	3032825118	CERAMIC 470P K 50V
C007	3033977618	CERAMIC 1U K 25V	C312	3034093426	CERAMIC 0.1U K 16V
C008	3033977618	CERAMIC 1U K 25V	C313	3034093426	CERAMIC 0.1U K 16V
C009	3033977618	CERAMIC 1U K 25V	C314	3032825118	CERAMIC 470P K 50V
C010	3033827814	CERAMIC 2.2U K 10V	C315	3033583215	CERAMIC 10U K 6.3V
C011	3033977618	CERAMIC 1U K 25V	C316	3034093426	CERAMIC 0.1U K 16V
C018	3033977618	CERAMIC 1U K 25V	C317	3034093426	CERAMIC 0.1U K 16V
C019	3033977618	CERAMIC 1U K 25V	C318	3034093426	CERAMIC 0.1U K 16V
C020	3033763112	ELECT 100U M 25V	C319	3032825118	CERAMIC 470P K 50V
C021	3033763112	ELECT 100U M 25V	C320	3033583215	CERAMIC 10U K 6.3V
C1002	3033983312	ELECT 47U M 10V	C321	3034093426	CERAMIC 0.1U K 16V
C1004	3034093426	CERAMIC 0.1U K 16V	C322	3034093426	CERAMIC 0.1U K 16V
C1006	3034093426	CERAMIC 0.1U K 16V	C323	3032825118	CERAMIC 470P K 50V
C1007	3034093426	CERAMIC 0.1U K 16V	C324	3034093426	CERAMIC 0.1U K 16V
C1008	3034093426	CERAMIC 0.1U K 16V	C326	3034093426	CERAMIC 0.1U K 16V
C1009	3034093426	CERAMIC 0.1U K 16V	C327	3034093426	CERAMIC 0.1U K 16V
C1010	3034093426	CERAMIC 0.1U K 16V	C328	3034093426	CERAMIC 0.1U K 16V
			C329	3032825118	CERAMIC 470P K 50V
			C330	3033766311	CERAMIC 0.47U K 10V
			C331	3034093426	CERAMIC 0.1U K 16V
			C332	3032825118	CERAMIC 470P K 50V
			C333	3034093426	CERAMIC 0.1U K 16V
			C334	3034093426	CERAMIC 0.1U K 16V
			C335	3034093426	CERAMIC 0.1U K 16V
			C336	3032825118	CERAMIC 470P K 50V
			C337	3034093426	CERAMIC 0.1U K 16V
			C338	3034093426	CERAMIC 0.1U K 16V
			C339	3034093426	CERAMIC 0.1U K 16V
			C341	3034093426	CERAMIC 0.1U K 16V
			C342	3034093426	CERAMIC 0.1U K 16V
			C343	3034093426	CERAMIC 0.1U K 16V
			C344	3034093426	CERAMIC 0.1U K 16V
			C346	3034093426	CERAMIC 0.1U K 16V
			C347	3034093426	CERAMIC 0.1U K 16V
			C348	3034093426	CERAMIC 0.1U K 16V

Electrical Parts List

PT-TW230U / TW230E / TW230EA
PT-TW231RU / TW231RE / TW231REA

Key No.	Part No.	Description	Key No.	Part No.	Description
C3501	3033977618	CERAMIC 1U K 25V	C3586	3032763113	CERAMIC 33P J 50V
C3502	3033977618	CERAMIC 1U K 25V	C3587	3032763113	CERAMIC 33P J 50V
C3503	3033977618	CERAMIC 1U K 25V	C3588	3032763113	CERAMIC 33P J 50V
C3504	3033977618	CERAMIC 1U K 25V	C3598	3033945815	CERAMIC 4.7U K 16V
C3506	3033815316	ELECT 100U M 16V	C3599	3034331112	CERAMIC 1U K 10V
C3508	3034374614	CERAMIC 10U K 25V	C361	3034331112	CERAMIC 1U K 10V
C3509	3033977618	CERAMIC 1U K 25V	C362	3034331112	CERAMIC 1U K 10V
C351	3034093426	CERAMIC 0.1U K 16V	C363	3034331112	CERAMIC 1U K 10V
C3511	3033977618	CERAMIC 1U K 25V	C364	3034419810	CERAMIC 0.01U K 50V
C3512	3032763113	CERAMIC 33P J 50V	C365	3034420519	CERAMIC 0.068U K 16V
C3513	3032763113	CERAMIC 33P J 50V	C366	3034093426	CERAMIC 0.1U K 16V
C3514	3032763113	CERAMIC 33P J 50V	C367	3034093426	CERAMIC 0.1U K 16V
C3516	3032763113	CERAMIC 33P J 50V	C368	3034093426	CERAMIC 0.1U K 16V
C3517	3032763113	CERAMIC 33P J 50V	C369	3034093426	CERAMIC 0.1U K 16V
C3518	3032763113	CERAMIC 33P J 50V	C370	3034093426	CERAMIC 0.1U K 16V
C3519	3032763113	CERAMIC 33P J 50V	C371	3034093426	CERAMIC 0.1U K 16V
C352	3034093426	CERAMIC 0.1U K 16V	C372	3033766311	CERAMIC 0.47U K 10V
C3521	3032763113	CERAMIC 33P J 50V	C373	3033766311	CERAMIC 0.47U K 10V
C3522	3032763113	CERAMIC 33P J 50V	C374	3033766311	CERAMIC 0.47U K 10V
C3523	3032763113	CERAMIC 33P J 50V	C377	3034093426	CERAMIC 0.1U K 16V
C3524	3032763113	CERAMIC 33P J 50V	C378	3034093426	CERAMIC 0.1U K 16V
C3526	3032763113	CERAMIC 33P J 50V	C379	3034093426	CERAMIC 0.1U K 16V
C3527	3032763113	CERAMIC 33P J 50V	C380	3034093426	CERAMIC 0.1U K 16V
C3528	3032763113	CERAMIC 33P J 50V	C3801	3034331112	CERAMIC 1U K 10V
C353	3034093426	CERAMIC 0.1U K 16V	C3802	3034331112	CERAMIC 1U K 10V
C3531	3033977618	CERAMIC 1U K 25V	C3803	3034331112	CERAMIC 1U K 10V
C3532	3033977618	CERAMIC 1U K 25V	C3804	3034331112	CERAMIC 1U K 10V
C3533	3033977618	CERAMIC 1U K 25V	C3806	3034331112	CERAMIC 1U K 10V
C3534	3033977618	CERAMIC 1U K 25V	C3807	3034093426	CERAMIC 0.1U K 16V
C3536	3033815316	ELECT 100U M 16V	C3808	3034093426	CERAMIC 0.1U K 16V
C3538	3034374614	CERAMIC 10U K 25V	C3809	3034093426	CERAMIC 0.1U K 16V
C3539	3033977618	CERAMIC 1U K 25V	C381	3034093426	CERAMIC 0.1U K 16V
C354	3034093426	CERAMIC 0.1U K 16V	C382	3034093426	CERAMIC 0.1U K 16V
C3541	3033977618	CERAMIC 1U K 25V	C383	3032825118	CERAMIC 470P K 50V
C3542	3032763113	CERAMIC 33P J 50V	C384	3032825118	CERAMIC 470P K 50V
C3543	3032763113	CERAMIC 33P J 50V	C385	3032825118	CERAMIC 470P K 50V
C3544	3032763113	CERAMIC 33P J 50V	C4001	3033827814	CERAMIC 2.2U K 10V
C3546	3032763113	CERAMIC 33P J 50V	C4002	3034093426	CERAMIC 0.1U K 16V
C3547	3032763113	CERAMIC 33P J 50V	C4003	3034093426	CERAMIC 0.1U K 16V
C3548	3032763113	CERAMIC 33P J 50V	C4004	3033827814	CERAMIC 2.2U K 10V
C3549	3032763113	CERAMIC 33P J 50V	C401	3032825118	CERAMIC 470P K 50V
C355	3034093426	CERAMIC 0.1U K 16V	C403	3032825118	CERAMIC 470P K 50V
C3551	3032763113	CERAMIC 33P J 50V	C406	3034093426	CERAMIC 0.1U K 16V
C3552	3032763113	CERAMIC 33P J 50V	C407	3032825118	CERAMIC 470P K 50V
C3553	3032763113	CERAMIC 33P J 50V	C411	3034093426	CERAMIC 0.1U K 16V
C3554	3032763113	CERAMIC 33P J 50V	C413	3032825118	CERAMIC 470P K 50V
C3556	3032763113	CERAMIC 33P J 50V	C414	3034093426	CERAMIC 0.1U K 16V
C3557	3032763113	CERAMIC 33P J 50V	C417	3033727510	CERAMIC 2.2U K 6.3V
C3558	3032763113	CERAMIC 33P J 50V	C421	3032825118	CERAMIC 470P K 50V
C356	3034093426	CERAMIC 0.1U K 16V	C423	3032825118	CERAMIC 470P K 50V
C3561	3033977618	CERAMIC 1U K 25V	C426	3034331112	CERAMIC 1U K 10V
C3562	3033977618	CERAMIC 1U K 25V	C427	3032825118	CERAMIC 470P K 50V
C3563	3033977618	CERAMIC 1U K 25V	C431	3032825118	CERAMIC 470P K 50V
C3564	3033977618	CERAMIC 1U K 25V	C432	3034093426	CERAMIC 0.1U K 16V
C3566	3033815316	ELECT 100U M 16V	C433	3032825118	CERAMIC 470P K 50V
C3568	3034374614	CERAMIC 10U K 25V	C434	3034093426	CERAMIC 0.1U K 16V
C3569	3033977618	CERAMIC 1U K 25V	C436	3034093426	CERAMIC 0.1U K 16V
C357	3034093426	CERAMIC 0.1U K 16V	C438	3034419810	CERAMIC 0.01U K 50V
C3571	3033977618	CERAMIC 1U K 25V	C439	3034331112	CERAMIC 1U K 10V
C3572	3032763113	CERAMIC 33P J 50V	C441	4034551616	CERAMIC 10U K 16V
C3573	3032763113	CERAMIC 33P J 50V	C442	3034331112	CERAMIC 1U K 10V
C3574	3032763113	CERAMIC 33P J 50V	C443	3032825118	CERAMIC 470P K 50V
C3576	3032763113	CERAMIC 33P J 50V	C480	3033583215	CERAMIC 10U K 6.3V
C3577	3032763113	CERAMIC 33P J 50V	C481	3033583215	CERAMIC 10U K 6.3V
C3578	3032763113	CERAMIC 33P J 50V	C4891	3034093426	CERAMIC 0.1U K 16V
C3579	3032763113	CERAMIC 33P J 50V	C5001	3033977618	CERAMIC 1U K 25V
C358	3034093426	CERAMIC 0.1U K 16V	C5002	3033977618	CERAMIC 1U K 25V
C3581	3032763113	CERAMIC 33P J 50V	C5004	3033977618	CERAMIC 1U K 25V
C3582	3032763113	CERAMIC 33P J 50V	C5006	3033977618	CERAMIC 1U K 25V
C3583	3032763113	CERAMIC 33P J 50V	C5007	3033977618	CERAMIC 1U K 25V
C3584	3032763113	CERAMIC 33P J 50V	C5009	3033977618	CERAMIC 1U K 25V

Electrical Parts List

Key No.	Part No.	Description	Key No.	Part No.	Description
C5011	3033945815	CERAMIC 4.7U K 16V	C5707	3033246417	CERAMIC 0.022U K 16V
C5012	3033945815	CERAMIC 4.7U K 16V	C5708	3033975713	ELECT 100U M 10V
C5013	3033945815	CERAMIC 4.7U K 16V	C571	3033978219	CERAMIC 2.2U K 25V
C5014	3033977618	CERAMIC 1U K 25V	C572	4034670911	CERAMIC 0.1U K 25V
C5024	4034551616	CERAMIC 10U K 16V	C573	4034670911	CERAMIC 0.1U K 25V
C5025	4034551616	CERAMIC 10U K 16V	C574	4034670911	CERAMIC 0.1U K 25V
C5026	4034551616	CERAMIC 10U K 16V	C576	4034670911	CERAMIC 0.1U K 25V
C503	3034093426	CERAMIC 0.1U K 16V	C577	4034670911	CERAMIC 0.1U K 25V
C5038	3034419810	CERAMIC 0.01U K 50V	C579	4034670911	CERAMIC 0.1U K 25V
C5039	3034419810	CERAMIC 0.01U K 50V	C581	3034093426	CERAMIC 0.1U K 16V
C504	3034093426	CERAMIC 0.1U K 16V	C5821	3034331112	CERAMIC 1U K 10V
C5061	4034551616	CERAMIC 10U K 16V	C5822	3032795114	CERAMIC 3300P K 50V
C5062	3033819918	ELECT 470U M 16V	C5823	3034093426	CERAMIC 0.1U K 16V
C5069	4034551616	CERAMIC 10U K 16V	C5824	4034551616	CERAMIC 10U K 16V
C507	3033583215	CERAMIC 10U K 6.3V	C5825	4034551616	CERAMIC 10U K 16V
C508	3034014312	ELECT 47U M 25V	C5827	3033925015	CERAMIC 22U M 6.3V
C509	3033727510	CERAMIC 2.2U K 6.3V	C5828	3033925015	CERAMIC 22U M 6.3V
C5098	4034551616	CERAMIC 10U K 16V	C5829	3034538214	CERAMIC 10P J 50V
C511	3033978219	CERAMIC 2.2U K 25V	C583	3033423313	CERAMIC 0.1U K 25V
C512	4034670911	CERAMIC 0.1U K 25V	C584	3033423313	CERAMIC 0.1U K 25V
C513	4034670911	CERAMIC 0.1U K 25V	C5840	3033827814	CERAMIC 2.2U K 10V
C514	4034670911	CERAMIC 0.1U K 25V	C5841	3034331112	CERAMIC 1U K 10V
C516	4034670911	CERAMIC 0.1U K 25V	C5843	3033583215	CERAMIC 10U K 6.3V
C517	4034670911	CERAMIC 0.1U K 25V	C5844	3034093426	CERAMIC 0.1U K 16V
C519	4034670911	CERAMIC 0.1U K 25V	C5860	3032989612	CERAMIC 0.1U K 16V
C521	3033977618	CERAMIC 1U K 25V	C5862	4034551616	CERAMIC 10U K 16V
C523	3033423313	CERAMIC 0.1U K 25V	C5863	3034093426	CERAMIC 0.1U K 16V
C524	3033423313	CERAMIC 0.1U K 25V	C5864	4034551616	CERAMIC 10U K 16V
C527	4034670911	CERAMIC 0.1U K 25V	C5866	3034331112	CERAMIC 1U K 10V
C528	4034670911	CERAMIC 0.1U K 25V	C5867	3032844317	CERAMIC 0.022U K 50V
C5304	3034419810	CERAMIC 0.01U K 50V	C5868	3034538214	CERAMIC 10P J 50V
C5315	3034093426	CERAMIC 0.1U K 16V	C5869	3033925015	CERAMIC 22U M 6.3V
C5316	3034420519	CERAMIC 0.068U K 16V	C587	4034670911	CERAMIC 0.1U K 25V
C533	3034093426	CERAMIC 0.1U K 16V	C5871	3033925015	CERAMIC 22U M 6.3V
C5331	3033727510	CERAMIC 2.2U K 6.3V	C588	4034670911	CERAMIC 0.1U K 25V
C5332	3034093426	CERAMIC 0.1U K 16V	C596	4034670911	CERAMIC 0.1U K 25V
C5334	3033200419	CERAMIC 68P J 50V	C597	3034374614	CERAMIC 10U K 25V
C5336	3032946110	CERAMIC 100P J 50V	C598	4034670911	CERAMIC 0.1U K 25V
C5337	3032946110	CERAMIC 100P J 50V	C599	3034013810	ELECT 10U M 25V
C534	3034093426	CERAMIC 0.1U K 16V	C6801	3034093426	CERAMIC 0.1U K 16V
C537	3033583215	CERAMIC 10U K 6.3V	C6802	3034093426	CERAMIC 0.1U K 16V
C538	3034014312	ELECT 47U M 25V	C6803	3034093426	CERAMIC 0.1U K 16V
C539	3033727510	CERAMIC 2.2U K 6.3V	C7080	3033827814	CERAMIC 2.2U K 10V
C541	3033978219	CERAMIC 2.2U K 25V	C7095	3033790217	POS-SOLID 68U M 6.3V
C542	4034670911	CERAMIC 0.1U K 25V	C7812	3034374614	CERAMIC 10U K 25V
C543	4034670911	CERAMIC 0.1U K 25V	C7813	3034374614	CERAMIC 10U K 25V
C544	4034670911	CERAMIC 0.1U K 25V	C7814	3033978219	CERAMIC 2.2U K 25V
C546	4034670911	CERAMIC 0.1U K 25V	C7815	3032753015	CERAMIC 0.047U K 16V
C547	4034670911	CERAMIC 0.1U K 25V	C7816	3033058812	CERAMIC 47P J 50V
C549	4034670911	CERAMIC 0.1U K 25V	C7817	3034419810	CERAMIC 0.01U K 50V
C551	3034093426	CERAMIC 0.1U K 16V	C7821	3033766311	CERAMIC 0.47U K 10V
C553	3033423313	CERAMIC 0.1U K 25V	C7822	3033766311	CERAMIC 0.47U K 10V
C554	3033423313	CERAMIC 0.1U K 25V	C7827	3033815613	ELECT 220U M 16V
C5541	3034374614	CERAMIC 10U K 25V	C7831	3032753015	CERAMIC 0.047U K 16V
C5542	4034670911	CERAMIC 0.1U K 25V	C7832	3033058812	CERAMIC 47P J 50V
C5544	3033921215	ELECT 47U M 6.3V	C7833	3033815613	ELECT 220U M 16V
C5548	3033819918	ELECT 470U M 16V	C7837	3034419810	CERAMIC 0.01U K 50V
C557	4034670911	CERAMIC 0.1U K 25V	C7839	3033945815	CERAMIC 4.7U K 16V
C558	4034670911	CERAMIC 0.1U K 25V	C7841	3034374614	CERAMIC 10U K 25V
C5612	3034093426	CERAMIC 0.1U K 16V	C7842	4034670911	CERAMIC 0.1U K 25V
C5614	3034331112	CERAMIC 1U K 10V	C7843	3033763112	ELECT 100U M 25V
C5616	3033983312	ELECT 47U M 10V	C7844	4034670911	CERAMIC 0.1U K 25V
C5621	3033835215	CERAMIC 4.7U K 6.3V	C8001	3033583215	CERAMIC 10U K 6.3V
C5623	3033835215	CERAMIC 4.7U K 6.3V	C8002	3034093426	CERAMIC 0.1U K 16V
C563	3034093426	CERAMIC 0.1U K 16V	C8003	3034093426	CERAMIC 0.1U K 16V
C564	3034093426	CERAMIC 0.1U K 16V	C8004	3034093426	CERAMIC 0.1U K 16V
C567	3033583215	CERAMIC 10U K 6.3V	C8006	3034093426	CERAMIC 0.1U K 16V
C568	3034014312	ELECT 47U M 25V	C8007	3034093426	CERAMIC 0.1U K 16V
C569	3033727510	CERAMIC 2.2U K 6.3V	C8008	3033583215	CERAMIC 10U K 6.3V
C5705	3033763112	ELECT 100U M 25V	C8009	3033583215	CERAMIC 10U K 6.3V
C5706	3034093426	CERAMIC 0.1U K 16V	C801	3034093426	CERAMIC 0.1U K 16V

Electrical Parts List

PT-TW230U /TW230E / TW230EA
PT-TW231RU /TW231RE / TW231REA

Key No.	Part No.	Description	Key No.	Part No.	Description
C8011	3034093426	CERAMIC 0.1U K 16V	C9883	3033921215	ELECT 47U M 6.3V
C8012	3033583215	CERAMIC 10U K 6.3V	C9884	3034093426	CERAMIC 0.1U K 16V
C8013	3034093426	CERAMIC 0.1U K 16V	D001	3072350816	DIODE 1SS387 TPL3
C8014	3031459918	CERAMIC 22P J 50V	D002	3072350816	DIODE 1SS387 TPL3
C8016	3031572518	CERAMIC 27P J 50V	D1001	3072091214	ZD UDZS-TE-176.2B
C8017	3034093426	CERAMIC 0.1U K 16V	D1002	3072091214	ZD UDZS-TE-176.2B
C8018	3034093426	CERAMIC 0.1U K 16V	D1003	3072055216	DIODE RB521S-30-TE61
C8019	3034093426	CERAMIC 0.1U K 16V	D1004	3072055216	DIODE RB521S-30-TE61
C8021	3034093426	CERAMIC 0.1U K 16V	D2025	3072350816	DIODE 1SS387 TPL3
C8022	3034093426	CERAMIC 0.1U K 16V	D2891	3072091214	ZD UDZS-TE-176.2B
C8023	3034093426	CERAMIC 0.1U K 16V	D2892	3072091214	ZD UDZS-TE-176.2B
C8024	3033583215	CERAMIC 10U K 6.3V	D3601	3072350816	DIODE 1SS387 TPL3
C8026	3033583215	CERAMIC 10U K 6.3V	D3602	3072350816	DIODE 1SS387 TPL3
C8027	3033583215	CERAMIC 10U K 6.3V	D3611	3072350816	DIODE 1SS387 TPL3
C8028	3034093426	CERAMIC 0.1U K 16V	D3613	3072350816	DIODE 1SS387 TPL3
C8029	3034093426	CERAMIC 0.1U K 16V	D3614	3072350816	DIODE 1SS387 TPL3
C8031	3034093426	CERAMIC 0.1U K 16V	D3617	3072350816	DIODE 1SS387 TPL3
C8032	3034093426	CERAMIC 0.1U K 16V	D3621	3072350816	DIODE 1SS387 TPL3
C8033	3034093426	CERAMIC 0.1U K 16V	D3622	3072350816	DIODE 1SS387 TPL3
C8034	3034093426	CERAMIC 0.1U K 16V	D3623	3072350816	DIODE 1SS387 TPL3
C8036	3034093426	CERAMIC 0.1U K 16V	D3626	3072350816	DIODE 1SS387 TPL3
C8037	3034093426	CERAMIC 0.1U K 16V	D3628	3072350816	DIODE 1SS387 TPL3
C8038	3033583215	CERAMIC 10U K 6.3V	D3629	3072350816	DIODE 1SS387 TPL3
C8091	3034331112	CERAMIC 1U K 10V	D3631	3072350816	DIODE 1SS387 TPL3
C8092	3033583215	CERAMIC 10U K 6.3V	D3644	3072350816	DIODE 1SS387 TPL3
C8093	3033790217	POS-SOLID 68U M 6.3V	D4001	3072350816	DIODE 1SS387 TPL3
C8094	3033945815	CERAMIC 4.7U K 16V	D5061	3072350816	DIODE 1SS387 TPL3
C8301	3033583215	CERAMIC 10U K 6.3V	D5062	3072350816	DIODE 1SS387 TPL3
C8302	3033583215	CERAMIC 10U K 6.3V	D5065	3071630414	DIODE 1SS352-(TPH3)
C8303	3034093426	CERAMIC 0.1U K 16V	D5602	3072105416	DIODE RB551V-30-TE-17
C841	3034331112	CERAMIC 1U K 10V	D5603	3072105416	DIODE RB551V-30-TE-17
C842	3033921215	ELECT 47U M 6.3V	D5625	3072350816	DIODE 1SS387 TPL3
C843	3034419810	CERAMIC 0.01U K 50V	D591	3072350816	DIODE 1SS387 TPL3
C844	3034541214	CERAMIC 1000P K 50V	D592	3072350816	DIODE 1SS387 TPL3
C8801	3034093426	CERAMIC 0.1U K 16V	D6801	3072091214	ZD UDZS-TE-176.2B
C8802	3034093426	CERAMIC 0.1U K 16V	D6802	3072091214	ZD UDZS-TE-176.2B
C8803	3034093426	CERAMIC 0.1U K 16V	D6803	3072091214	ZD UDZS-TE-176.2B
C8804	3034093426	CERAMIC 0.1U K 16V	D6804	3072091214	ZD UDZS-TE-176.2B
C8805	3034093426	CERAMIC 0.1U K 16V	D6831	4080685508	LED KPT-2012YC
C8806	3034093426	CERAMIC 0.1U K 16V	D6833	3072037816	LED SML-210LT T86 M
C8807	3034093426	CERAMIC 0.1U K 16V	D6835	4080685201	LED KPTB-1612ESGC
C8808	3034093426	CERAMIC 0.1U K 16V	D6841	3072091214	ZD UDZS-TE-176.2B
C8809	3034093426	CERAMIC 0.1U K 16V	D6842	3072091214	ZD UDZS-TE-176.2B
C8811	3034093426	CERAMIC 0.1U K 16V	D6845	3072091214	ZD UDZS-TE-176.2B
C8812	3034093426	CERAMIC 0.1U K 16V	D6846	3072091214	ZD UDZS-TE-176.2B
C8815	3034093426	CERAMIC 0.1U K 16V	D7081	3072350816	DIODE 1SS387 TPL3
C8816	3034093426	CERAMIC 0.1U K 16V	D7812	4072674513	DIODE RB050M-30-TR
C8817	3034093426	CERAMIC 0.1U K 16V	D7862	4072674513	DIODE RB050M-30-TR
C8818	3034093426	CERAMIC 0.1U K 16V	D8091	4072674513	DIODE RB050M-30-TR
C8822	3032763113	CERAMIC 33P J 50V	D8092	3072350816	DIODE 1SS387 TPL3
C8823	3034093426	CERAMIC 0.1U K 16V	D8093	3072350816	DIODE 1SS387 TPL3
C8824	3032763113	CERAMIC 33P J 50V	D8094	3072350816	DIODE 1SS387 TPL3
C8830	3034093426	CERAMIC 0.1U K 16V	IC001	4107311908	IC TPA3111D1PWPR
C8831	3033915412	ELECT 22U M 6.3V	IC1051	4107058308	IC M24C02-WMN6TP
C8832	3034093426	CERAMIC 0.1U K 16V	IC1371	4106568600	IC 24AA64T-I/MS
C8834	3033915412	ELECT 22U M 6.3V	IC301	4097117019	IC PW190-10SG
C8835	3033915412	ELECT 22U M 6.3V	IC3801	4106301603	IC ICL3232ECV-16Z-T
C8836	3033915412	ELECT 22U M 6.3V	IC3802	3103494103	IC TC7W241FU(Te12L)
C8837	3034093426	CERAMIC 0.1U K 16V	IC3803	3103494103	IC TC7W241FU(Te12L)
C8838	3034093426	CERAMIC 0.1U K 16V	IC3804	3103494103	IC TC7W241FU(Te12L)
C8839	3034093426	CERAMIC 0.1U K 16V	IC4001	4106864702	IC EL5306IUZ-T7
C8843	3034093426	CERAMIC 0.1U K 16V	IC401	4096831718	IC L3E07111K0A
C8847	3033977618	CERAMIC 1U K 25V	IC4701	3094288428	IC TC7WT125FU-TE12L
C8848	3034093426	CERAMIC 0.1U K 16V	IC4891	4097142011	IC TC7SH00FU(Te85L JF
C8855	3032762918	CERAMIC 12P J 50V	IC5001	4096835716	IC NJW1156AV
C8856	3032762918	CERAMIC 12P J 50V	IC501	4097053911	IC L3E06200POA
C8860	3032152214	CERAMIC 0.01U K 50V	IC5301	3105960101	IC 74LVC14APW,118
C8863	3033915412	ELECT 22U M 6.3V	IC531	4097053911	IC L3E06200POA
C9875	3033058812	CERAMIC 47P J 50V	IC5542	4106568501	IC XC6216BC02MR
C9878	3033246417	CERAMIC 0.022U K 16V	IC5602	4107312103	IC XC6204F502PR-G
C9882	3034093426	CERAMIC 0.1U K 16V	IC561	4097053911	IC L3E06200POA

Electrical Parts List

Key No.	Part No.	Description	Key No.	Part No.	Description
IC5621	4106510104	IC R1131D101B-TR-F	L3623	6520028524	INDUCTOR 220OHM, P
IC5821	4107312004	IC TPS54327DDAR	L3626	6520028524	INDUCTOR 220OHM, P
IC5841	3095985217	IC TAR5S25	L3627	6520028524	INDUCTOR 220OHM, P
IC5861	4107312004	IC TPS54327DDAR	L3628	6520028685	INDUCTOR 1000OHM, P
IC592	4097130612	IC LM29152RS5LP	L3630	6520028524	INDUCTOR 220OHM, P
IC7811	4107064705	IC TPS54286PWPR	L3631	6520028685	INDUCTOR 1000OHM, P
IC7841	3094617822	IC PQ20WZ11	L3633	6520028685	INDUCTOR 1000OHM, P
IC8001	4096985510	IC SII9127ACTU	L3634	6520028685	INDUCTOR 1000OHM, P
IC801	4107343701	IC M29W640FT70N6E-KW4CC	L3636	6520028524	INDUCTOR 220OHM, P
IC8091	4107357500	IC TJ3965GRS-ADJ-5L	L3638	6520028685	INDUCTOR 1000OHM, P
IC8301	3095796516	IC PCM1754DBQR	L3639	6520028524	INDUCTOR 220OHM, P
IC841	4096993010	IC PT7M7809STE	L3691	6520028685	INDUCTOR 1000OHM, P
IC8801	4107343800	IC AX11005LF-KW4CC	L3692	6520028685	INDUCTOR 1000OHM, P
IC8821	4106312708	IC MCP9801T-M/SN	L402	6520028500	INDUCTOR 330OHM, P
IC9882	3105960101	IC 74LVC14APW,118	L4809	6520028685	INDUCTOR 1000OHM, P
IC9885	4107333108	IC MB95F353EPFT-G-SNERE2	L4810	6520028685	INDUCTOR 1000OHM, P
K10A	9520018601	SOCKET,D-SUB 15P	L4811	6520028685	INDUCTOR 1000OHM, P
K10B	9520018571	SOCKET,D-SUB 15P	L4812	6520028524	INDUCTOR 220OHM, P
K20A	9520019585	JACK,RCA-2	L4814	6520028685	INDUCTOR 1000OHM, P
K20B	9520017932	TERMINAL, BOARD	L501	6520028500	INDUCTOR 330OHM, P
K20C	6520024847	JACK,PHONE D3.6	L531	6520028500	INDUCTOR 330OHM, P
K40B	6520028135	PLUG,D-SUB 9P	L5332	9450328344	INDUCTOR,39U J
K8001	6520032194	SOCKET,HDMI 19P	L5606	6520028500	INDUCTOR 330OHM, P
K8801	6520032743	TRANS,PULSE	L5608	6520028500	INDUCTOR 330OHM, P
L003	6520028500	INDUCTOR 330OHM, P	L5609	6520028500	INDUCTOR 330OHM, P
L011	9450622855	INDUCTOR,33U M	L561	6520028500	INDUCTOR 330OHM, P
L012	9450622855	INDUCTOR,33U M	L5662	6520028500	INDUCTOR 330OHM, P
L1002	9450867577	FILTER,EMI 400MHZ	L5701	6520028500	INDUCTOR 330OHM, P
L1012	9450867577	FILTER,EMI 400MHZ	L5703	6520028500	INDUCTOR 330OHM, P
L1022	9450867577	FILTER,EMI 400MHZ	L5821	6451048431	INDUCTOR,2.2U N
L1051	9450867577	FILTER,EMI 400MHZ	L5822	6520028500	INDUCTOR 330OHM, P
L1061	9450867577	FILTER,EMI 400MHZ	L5828	6520028500	INDUCTOR 330OHM, P
L1071	9450867577	FILTER,EMI 400MHZ	L5830	6520028500	INDUCTOR 330OHM, P
L2011	3010375017	MT-GLAZE 0.000 ZA 1/10W	L5831	6520028500	INDUCTOR 330OHM, P
L2012	9450688318	FILTER,EMI 100MHZ	L5848	6520028500	INDUCTOR 330OHM, P
L2021	3010375017	MT-GLAZE 0.000 ZA 1/10W	L5861	6451048431	INDUCTOR,2.2U N
L2022	9450688318	FILTER,EMI 100MHZ	L5862	6520028500	INDUCTOR 330OHM, P
L2031	3010375017	MT-GLAZE 0.000 ZA 1/10W	L5868	6520028500	INDUCTOR 330OHM, P
L2032	9450688318	FILTER,EMI 100MHZ	L7081	6520028500	INDUCTOR 330OHM, P
L2041	9450688325	FILTER,EMI 20MHZ	L7811	6520031890	INDUCTOR,15U, M
L2051	9450688325	FILTER,EMI 20MHZ	L7861	6520031890	INDUCTOR,15U, M
L2881	6520028524	INDUCTOR 220OHM, P	L8001	9450866600	IMPEDANCE,220 OHM P
L2882	6520028524	INDUCTOR 220OHM, P	L8002	9450866600	IMPEDANCE,220 OHM P
L2883	6520028524	INDUCTOR 220OHM, P	L8003	9450866600	IMPEDANCE,220 OHM P
L2884	6520028524	INDUCTOR 220OHM, P	L8004	9450866600	IMPEDANCE,220 OHM P
L2891	6520028524	INDUCTOR 220OHM, P	L8006	9450866600	IMPEDANCE,220 OHM P
L2892	6520028685	INDUCTOR 1000OHM, P	L8007	9450866600	IMPEDANCE,220 OHM P
L2893	6520028524	INDUCTOR 220OHM, P	L8010	6520036499	INDUCTOR,90 OHM
L2894	6520028524	INDUCTOR 220OHM, P	L8011	6520036499	INDUCTOR,90 OHM
L2896	6520028524	INDUCTOR 220OHM, P	L8012	6520036499	INDUCTOR,90 OHM
L2897	6520028524	INDUCTOR 220OHM, P	L8013	6520036499	INDUCTOR,90 OHM
L2898	6520028524	INDUCTOR 220OHM, P	L8020	3012261516	MT-GLAZE 0.000 ZA 1/16W
L2899	6520028524	INDUCTOR 220OHM, P	L8091	6520028500	INDUCTOR 330OHM, P
L301	6520028524	INDUCTOR 220OHM, P	L8166	6520028524	INDUCTOR 220OHM, P
L302	6520028524	INDUCTOR 220OHM, P	L8801	9450688318	FILTER,EMI 100MHZ
L303	6520028524	INDUCTOR 220OHM, P	L8802	9450688318	FILTER,EMI 100MHZ
L304	6520028524	INDUCTOR 220OHM, P	L8810	6520028500	INDUCTOR 330OHM, P
L305	6520028524	INDUCTOR 220OHM, P	L8835	6451009340	IMPEDANCE,120 OHM P
L306	6520028524	INDUCTOR 220OHM, P	L8836	6451009340	IMPEDANCE,120 OHM P
L307	6520028524	INDUCTOR 220OHM, P	Q1001	4060217804	TR 2SC4617
L308	6520028524	INDUCTOR 220OHM, P	Q1002	4060217804	TR 2SC4617
L309	6520028524	INDUCTOR 220OHM, P	Q1003	3052177815	TR HN1B04FE-Y TE85L
L311	6520028524	INDUCTOR 220OHM, P	Q1004	3052177815	TR HN1B04FE-Y TE85L
L312	6520028524	INDUCTOR 220OHM, P	Q1005	4060217804	TR 2SC4617
L313	6520028524	INDUCTOR 220OHM, P	Q1006	3052177815	TR HN1B04FE-Y TE85L
L314	6520028524	INDUCTOR 220OHM, P	Q1007	4060217804	TR 2SC4617
L3501	6520028500	INDUCTOR 330OHM, P	Q1008	4060217804	TR 2SC4617
L3531	6520028500	INDUCTOR 330OHM, P	Q1012	4060217804	TR 2SC4617
L3534	9450412210	INDUCTOR,0.12U K	Q2011	4060217804	TR 2SC4617
L3561	6520028500	INDUCTOR 330OHM, P	Q2021	4060217804	TR 2SC4617
L3622	6520028524	INDUCTOR 220OHM, P	Q2025	4060217804	TR 2SC4617

Electrical Parts List

PT-TW230U / TW230E / TW230EA
PT-TW231RU / TW231RE / TW231REA

Key No. Part No. Description			Key No. Part No. Description		
Q2031	4060217804	TR 2SC4617	R1075	3012637420	MT-GLAZE 75 JA 1/16W
Q3582	3052176917	TR TPC6107 TE85L	R1077	3012637420	MT-GLAZE 75 JA 1/16W
Q3583	4060217804	TR 2SC4617	R1078	3012637420	MT-GLAZE 75 JA 1/16W
Q3601	4060217804	TR 2SC4617	R1079	3012637420	MT-GLAZE 75 JA 1/16W
Q4012	4052203016	TR ISA1235AC1F	R1080	3012637420	MT-GLAZE 75 JA 1/16W
Q4014	3052177815	TR HN1B04FE-Y TE85L	R1081	3012251418	MT-GLAZE 47K JA 1/16W
Q4015	3052177815	TR HN1B04FE-Y TE85L	R1083	3012258110	MT-GLAZE 10 JA 1/16W
Q4016	3052177815	TR HN1B04FE-Y TE85L	R1084	3012249316	MT-GLAZE 1K JA 1/16W
Q5031	4052217914	TR HN1C01FE-Y	R1085	3012251814	MT-GLAZE 47 JA 1/16W
Q5035	4052217914	TR HN1C01FE-Y	R1088	3012249316	MT-GLAZE 1K JA 1/16W
Q5061	4052217914	TR HN1C01FE-Y	R1091	3012251418	MT-GLAZE 47K JA 1/16W
Q5062	4052217914	TR HN1C01FE-Y	R1101	3012248814	MT-GLAZE 100 JA 1/16W
Q5306	4060217804	TR 2SC4617	R1111	3012604115	MT-GLAZE 75 JA 1/3W
Q5336	4052203016	TR ISA1235AC1F	R1134	3012258110	MT-GLAZE 10 JA 1/16W
Q5700	3052177815	TR HN1B04FE-Y TE85L	R1331	3012249415	MT-GLAZE 1M JA 1/16W
Q5701	3051741819	TR CPH3424-TL-E	R2002	3012248814	MT-GLAZE 100 JA 1/16W
Q5704	3051589213	TR IMZ4-T108	R2006	3010375116	MT-GLAZE 10 JA 1/10W
Q5830	3052176917	TR TPC6107 TE85L	R2007	3010375116	MT-GLAZE 10 JA 1/10W
Q5840	4060217804	TR 2SC4617	R2011	3012248814	MT-GLAZE 100 JA 1/16W
Q6846	3050144611	TR 2SC2412K T146 S	R2012	3012604115	MT-GLAZE 75 JA 1/3W
Q7081	3050028327	TR 2SA1203-Y-TE12L	R2016	3012253818	MT-GLAZE 1.5K JA 1/16W
Q7082	4060217804	TR 2SC4617	R2018	3012604115	MT-GLAZE 75 JA 1/3W
Q7801	4060217804	TR 2SC4617	R2021	3012248814	MT-GLAZE 100 JA 1/16W
Q7813	3052177815	TR HN1B04FE-Y TE85L	R2022	3012248814	MT-GLAZE 100 JA 1/16W
Q7814	3052177815	TR HN1B04FE-Y TE85L	R2024	3012248814	MT-GLAZE 100 JA 1/16W
Q7842	3052177815	TR HN1B04FE-Y TE85L	R2025	3012249415	MT-GLAZE 1M JA 1/16W
Q7864	3052177815	TR HN1B04FE-Y TE85L	R2026	3012248913	MT-GLAZE 100K JA 1/16W
R001	3012249316	MT-GLAZE 1K JA 1/16W	R2027	3012248913	MT-GLAZE 100K JA 1/16W
R002	3012250510	MT-GLAZE 33K JA 1/16W	R2028	3012249910	MT-GLAZE 22K JA 1/16W
R003	3012652611	MT-GLAZE 5.1K FA 1/10W	R2029	3012253818	MT-GLAZE 1.5K JA 1/16W
R004	3012642711	MT-GLAZE 120 FA 1/10W	R2031	3012248913	MT-GLAZE 100K JA 1/16W
R009	3012649314	MT-GLAZE 3.3K FA 1/10W	R2032	3012248814	MT-GLAZE 100 JA 1/16W
R010	3012251913	MT-GLAZE 68 JA 1/16W	R2033	3012604115	MT-GLAZE 75 JA 1/3W
R011	3012560312	MT-GLAZE 820 JA 1/10W	R2034	3012248814	MT-GLAZE 100 JA 1/16W
R012	3012261516	MT-GLAZE 0.000 ZA 1/16W	R2036	3012253818	MT-GLAZE 1.5K JA 1/16W
R013	3011505819	MT-GLAZE 100K JA 1/10W	R2041	3012248913	MT-GLAZE 100K JA 1/16W
R014	3012261516	MT-GLAZE 0.000 ZA 1/16W	R2043	3012248814	MT-GLAZE 100 JA 1/16W
R1001	3012604115	MT-GLAZE 75 JA 1/3W	R2053	3012248814	MT-GLAZE 100 JA 1/16W
R1002	3012251210	MT-GLAZE 4.7K JA 1/16W	R2054	3012248814	MT-GLAZE 100 JA 1/16W
R1004	3012251210	MT-GLAZE 4.7K JA 1/16W	R2892	3012248814	MT-GLAZE 100 JA 1/16W
R1012	3012248814	MT-GLAZE 100 JA 1/16W	R300	3012249019	MT-GLAZE 10K JA 1/16W
R1021	3012604115	MT-GLAZE 75 JA 1/3W	R302	3012275612	MT-GLAZE 8.2K JA 1/16W
R1022	3012248814	MT-GLAZE 100 JA 1/16W	R303	3012249316	MT-GLAZE 1K JA 1/16W
R1025	3012604214	MT-GLAZE 82 JA 1/3W	R304	3012249316	MT-GLAZE 1K JA 1/16W
R1026	3012604214	MT-GLAZE 82 JA 1/3W	R306	4013427314	MT-GLAZE 23.2K FA 1/16W
R1028	3012604214	MT-GLAZE 82 JA 1/3W	R307	3012637420	MT-GLAZE 75 JA 1/16W
R1029	3012252019	MT-GLAZE 680 JA 1/16W	R308	3012637420	MT-GLAZE 75 JA 1/16W
R1031	3012251418	MT-GLAZE 47K JA 1/16W	R309	3012249316	MT-GLAZE 1K JA 1/16W
R1032	3012251814	MT-GLAZE 47 JA 1/16W	R311	3012249316	MT-GLAZE 1K JA 1/16W
R1034	3012251814	MT-GLAZE 47 JA 1/16W	R315	3012251814	MT-GLAZE 47 JA 1/16W
R1035	3012258110	MT-GLAZE 10 JA 1/16W	R317	3012251814	MT-GLAZE 47 JA 1/16W
R1036	3012258110	MT-GLAZE 10 JA 1/16W	R318	3012261516	MT-GLAZE 0.000 ZA 1/16W
R1037	3012258110	MT-GLAZE 10 JA 1/16W	R319	3012249019	MT-GLAZE 10K JA 1/16W
R1038	3012248814	MT-GLAZE 100 JA 1/16W	R320	3012251814	MT-GLAZE 47 JA 1/16W
R1039	3012258110	MT-GLAZE 10 JA 1/16W	R321	3012250213	MT-GLAZE 3.3K JA 1/16W
R1040	3012249316	MT-GLAZE 1K JA 1/16W	R322	3012250213	MT-GLAZE 3.3K JA 1/16W
R1041	3012251418	MT-GLAZE 47K JA 1/16W	R323	3012251814	MT-GLAZE 47 JA 1/16W
R1043	3012249019	MT-GLAZE 10K JA 1/16W	R327	3012258011	MT-GLAZE 330 JA 1/16W
R1044	3012249019	MT-GLAZE 10K JA 1/16W	R339	3012250213	MT-GLAZE 3.3K JA 1/16W
R1049	3012248814	MT-GLAZE 100 JA 1/16W	R341	3012250213	MT-GLAZE 3.3K JA 1/16W
R1050	3012249316	MT-GLAZE 1K JA 1/16W	R342	3012250213	MT-GLAZE 3.3K JA 1/16W
R1052	3012637420	MT-GLAZE 75 JA 1/16W	R343	3012250213	MT-GLAZE 3.3K JA 1/16W
R1060	3012249316	MT-GLAZE 1K JA 1/16W	R344	3012251814	MT-GLAZE 47 JA 1/16W
R1062	3012637420	MT-GLAZE 75 JA 1/16W	R345	3012251814	MT-GLAZE 47 JA 1/16W
R1063	3012252019	MT-GLAZE 680 JA 1/16W	R346	3012251814	MT-GLAZE 47 JA 1/16W
R1064	3012252019	MT-GLAZE 680 JA 1/16W	R348	3012248814	MT-GLAZE 100 JA 1/16W
R1065	3012249316	MT-GLAZE 1K JA 1/16W	R349	3012251814	MT-GLAZE 47 JA 1/16W
R1066	3012253818	MT-GLAZE 1.5K JA 1/16W	R350	3012637420	MT-GLAZE 75 JA 1/16W
R1069	3012253818	MT-GLAZE 1.5K JA 1/16W	R3502	3012251418	MT-GLAZE 47K JA 1/16W
R1070	3012637420	MT-GLAZE 75 JA 1/16W	R351	3012248814	MT-GLAZE 100 JA 1/16W
R1072	3012637420	MT-GLAZE 75 JA 1/16W	R352	3012251814	MT-GLAZE 47 JA 1/16W

Electrical Parts List

Key No. Part No. Description			Key No. Part No. Description		
R353	3012637420	MT-GLAZE 75 JA 1/16W	R422	3012251814	MT-GLAZE 47 JA 1/16W
R3532	3012251418	MT-GLAZE 47K JA 1/16W	R423	3012251814	MT-GLAZE 47 JA 1/16W
R354	3012248814	MT-GLAZE 100 JA 1/16W	R424	3012251210	MT-GLAZE 4.7K JA 1/16W
R355	3012248814	MT-GLAZE 100 JA 1/16W	R472	3012261516	MT-GLAZE 0.000 ZA 1/16W
R3562	3012251418	MT-GLAZE 47K JA 1/16W	R4834	3012253818	MT-GLAZE 1.5K JA 1/16W
R3580	3010375017	MT-GLAZE 0.000 ZA 1/10W	R4862	3012257915	MT-GLAZE 220 JA 1/16W
R3585	3012249019	MT-GLAZE 10K JA 1/16W	R4863	3012257915	MT-GLAZE 220 JA 1/16W
R3586	3012249316	MT-GLAZE 1K JA 1/16W	R5002	3012258110	MT-GLAZE 10 JA 1/16W
R3587	3012249019	MT-GLAZE 10K JA 1/16W	R5003	3012258110	MT-GLAZE 10 JA 1/16W
R3588	3012251210	MT-GLAZE 4.7K JA 1/16W	R5004	3012248913	MT-GLAZE 100K JA 1/16W
R359	3012250015	MT-GLAZE 270 JA 1/16W	R5005	3012248913	MT-GLAZE 100K JA 1/16W
R360	3012250015	MT-GLAZE 270 JA 1/16W	R5006	3012248913	MT-GLAZE 100K JA 1/16W
R3601	3012250213	MT-GLAZE 3.3K JA 1/16W	R5007	3012248913	MT-GLAZE 100K JA 1/16W
R3602	3012249019	MT-GLAZE 10K JA 1/16W	R5008	3012248913	MT-GLAZE 100K JA 1/16W
R3603	3012249019	MT-GLAZE 10K JA 1/16W	R5009	3012248913	MT-GLAZE 100K JA 1/16W
R361	3012561517	MT-GLAZE 13K JA 1/10W	R501	3012248814	MT-GLAZE 100 JA 1/16W
R3621	3012249019	MT-GLAZE 10K JA 1/16W	R5031	3012248814	MT-GLAZE 100 JA 1/16W
R3622	3012249019	MT-GLAZE 10K JA 1/16W	R5032	3012248814	MT-GLAZE 100 JA 1/16W
R3623	3012249019	MT-GLAZE 10K JA 1/16W	R5033	3012250213	MT-GLAZE 3.3K JA 1/16W
R3626	3012249019	MT-GLAZE 10K JA 1/16W	R5034	3012249316	MT-GLAZE 1K JA 1/16W
R3627	3012249019	MT-GLAZE 10K JA 1/16W	R5036	3012250213	MT-GLAZE 3.3K JA 1/16W
R3628	3012249019	MT-GLAZE 10K JA 1/16W	R5037	3012249316	MT-GLAZE 1K JA 1/16W
R363	3012249316	MT-GLAZE 1K JA 1/16W	R5046	3012249019	MT-GLAZE 10K JA 1/16W
R3631	3012249019	MT-GLAZE 10K JA 1/16W	R5047	3012249613	MT-GLAZE 2.7K JA 1/16W
R364	3012249316	MT-GLAZE 1K JA 1/16W	R5048	3012249316	MT-GLAZE 1K JA 1/16W
R366	3012249316	MT-GLAZE 1K JA 1/16W	R5061	3012249316	MT-GLAZE 1K JA 1/16W
R367	3012251814	MT-GLAZE 47 JA 1/16W	R5062	3012250213	MT-GLAZE 3.3K JA 1/16W
R368	3012251814	MT-GLAZE 47 JA 1/16W	R5063	3012249316	MT-GLAZE 1K JA 1/16W
R369	3012261516	MT-GLAZE 0.000 ZA 1/16W	R5064	3012249316	MT-GLAZE 1K JA 1/16W
R371	3012293913	MT-GLAZE 180 JA 1/16W	R5066	3012250213	MT-GLAZE 3.3K JA 1/16W
R372	3012293913	MT-GLAZE 180 JA 1/16W	R5067	3012249316	MT-GLAZE 1K JA 1/16W
R373	3012293913	MT-GLAZE 180 JA 1/16W	R5069	3012258011	MT-GLAZE 330 JA 1/16W
R374	3012293913	MT-GLAZE 180 JA 1/16W	R507	3012261516	MT-GLAZE 0.000 ZA 1/16W
R378	3012249019	MT-GLAZE 10K JA 1/16W	R5072	3012249019	MT-GLAZE 10K JA 1/16W
R380	3012249019	MT-GLAZE 10K JA 1/16W	R511	3012248814	MT-GLAZE 100 JA 1/16W
R3801	3012258110	MT-GLAZE 10 JA 1/16W	R512	3012248814	MT-GLAZE 100 JA 1/16W
R3802	3012258110	MT-GLAZE 10 JA 1/16W	R513	3012248814	MT-GLAZE 100 JA 1/16W
R3803	3012258110	MT-GLAZE 10 JA 1/16W	R5213	3012248814	MT-GLAZE 100 JA 1/16W
R3804	3012258516	MT-GLAZE 1.8K JA 1/16W	R5215	3012248814	MT-GLAZE 100 JA 1/16W
R3805	3012261516	MT-GLAZE 0.000 ZA 1/16W	R5220	3012248814	MT-GLAZE 100 JA 1/16W
R3806	3012251517	MT-GLAZE 3.9K JA 1/16W	R5223	3012248814	MT-GLAZE 100 JA 1/16W
R3811	3012249316	MT-GLAZE 1K JA 1/16W	R531	3012248814	MT-GLAZE 100 JA 1/16W
R3816	3012261516	MT-GLAZE 0.000 ZA 1/16W	R5317	3012251814	MT-GLAZE 47 JA 1/16W
R382	3012637420	MT-GLAZE 75 JA 1/16W	R5318	3012251210	MT-GLAZE 4.7K JA 1/16W
R388	3012251210	MT-GLAZE 4.7K JA 1/16W	R5331	3012409710	MT-GLAZE 820K JA 1/16W
R389	3012250817	MT-GLAZE 68K JA 1/16W	R5332	3012249316	MT-GLAZE 1K JA 1/16W
R391	3012249019	MT-GLAZE 10K JA 1/16W	R5333	3012249316	MT-GLAZE 1K JA 1/16W
*R395	3012249019	MT-GLAZE 10K JA 1/16W	R5334	3012249019	MT-GLAZE 10K JA 1/16W
		PT-TW230 Series only	R5336	3012249316	MT-GLAZE 1K JA 1/16W
*R396	3012261516	MT-GLAZE 0.000 ZA 1/16W	R5337	3012249316	MT-GLAZE 1K JA 1/16W
		PT-TW231R Series only	R5338	3012262414	MT-GLAZE 560 JA 1/16W
R398	3012248814	MT-GLAZE 100 JA 1/16W	R5342	3012251418	MT-GLAZE 47K JA 1/16W
R4001	3012248814	MT-GLAZE 100 JA 1/16W	R5343	3012249316	MT-GLAZE 1K JA 1/16W
R401	3012248814	MT-GLAZE 100 JA 1/16W	R5347	3012261516	MT-GLAZE 0.000 ZA 1/16W
R4014	3012251210	MT-GLAZE 4.7K JA 1/16W	R537	3012261516	MT-GLAZE 0.000 ZA 1/16W
R4016	3012251210	MT-GLAZE 4.7K JA 1/16W	R541	3012248814	MT-GLAZE 100 JA 1/16W
R4017	3012251210	MT-GLAZE 4.7K JA 1/16W	R542	3012248814	MT-GLAZE 100 JA 1/16W
R402	3012248814	MT-GLAZE 100 JA 1/16W	R543	3012248814	MT-GLAZE 100 JA 1/16W
R4023	3012249019	MT-GLAZE 10K JA 1/16W	R5541	3011506014	MT-GLAZE 0.000 ZA 1/10W
R4024	3012251210	MT-GLAZE 4.7K JA 1/16W	R5542	3012249316	MT-GLAZE 1K JA 1/16W
R403	3012248814	MT-GLAZE 100 JA 1/16W	R5545	3012249613	MT-GLAZE 2.7K JA 1/16W
R406	3012261516	MT-GLAZE 0.000 ZA 1/16W	R5607	3012249316	MT-GLAZE 1K JA 1/16W
R407	3012261516	MT-GLAZE 0.000 ZA 1/16W	R561	3012248814	MT-GLAZE 100 JA 1/16W
R4072	3012248814	MT-GLAZE 100 JA 1/16W	R5611	3012248814	MT-GLAZE 100 JA 1/16W
R4077	3012248814	MT-GLAZE 100 JA 1/16W	R567	3012261516	MT-GLAZE 0.000 ZA 1/16W
R408	3012261516	MT-GLAZE 0.000 ZA 1/16W	R5701	3012597823	MT-GLAZE 20K JA 1/16W
R412	3012251814	MT-GLAZE 47 JA 1/16W	R5702	3012250718	MT-GLAZE 56K JA 1/16W
R414	3012251814	MT-GLAZE 47 JA 1/16W	R5703	3012249019	MT-GLAZE 10K JA 1/16W
R416	3012251814	MT-GLAZE 47 JA 1/16W	R5704	3012248814	MT-GLAZE 100 JA 1/16W
R418	3012251814	MT-GLAZE 47 JA 1/16W	R5705	3012249019	MT-GLAZE 10K JA 1/16W
R419	3012251814	MT-GLAZE 47 JA 1/16W	R5706	3012249019	MT-GLAZE 10K JA 1/16W

Electrical Parts List

PT-TW230U /TW230E / TW230EA
PT-TW231RU /TW231RE / TW231REA

Key No. Part No. Description			Key No. Part No. Description		
R571	3012248814	MT-GLAZE 100 JA 1/16W	R7873	3012646115	MT-GLAZE 20K FA 1/10W
R5716	3012764710	MT-GLAZE 0.000 ZA 1/3W	R7874	3012994810	MT-GLAZE 2.7K FA 1/16W
R572	3012248814	MT-GLAZE 100 JA 1/16W	R7878	3012249019	MT-GLAZE 10K JA 1/16W
R573	3012248814	MT-GLAZE 100 JA 1/16W	R7879	3012249316	MT-GLAZE 1K JA 1/16W
R5741	3012249019	MT-GLAZE 10K JA 1/16W	R7881	3012249316	MT-GLAZE 1K JA 1/16W
R5742	3012250213	MT-GLAZE 3.3K JA 1/16W	R7882	3012250213	MT-GLAZE 3.3K JA 1/16W
R5744	3012249019	MT-GLAZE 10K JA 1/16W	R7883	3012249514	MT-GLAZE 2.2K JA 1/16W
R5745	3012261516	MT-GLAZE 0.000 ZA 1/16W	R8001	3012645316	MT-GLAZE 2.2 JA 1/10W
R5747	3012249019	MT-GLAZE 10K JA 1/16W	R8002	3012645316	MT-GLAZE 2.2 JA 1/10W
R5822	3012248913	MT-GLAZE 100K JA 1/16W	R8003	3012261516	MT-GLAZE 0.000 ZA 1/16W
R5823	3012943214	MT-GLAZE 47K FA 1/16W	R8004	3012249415	MT-GLAZE 1M JA 1/16W
R5824	3012943511	MT-GLAZE 27K FA 1/16W	R8008	3012251210	MT-GLAZE 4.7K JA 1/16W
R5825	3012872227	MT-GLAZE 22K FA 1/16W	R8009	3012251210	MT-GLAZE 4.7K JA 1/16W
R5837	3012249019	MT-GLAZE 10K JA 1/16W	R801	3012249019	MT-GLAZE 10K JA 1/16W
R5838	3012249316	MT-GLAZE 1K JA 1/16W	R8014	3012251210	MT-GLAZE 4.7K JA 1/16W
R5839	3012251210	MT-GLAZE 4.7K JA 1/16W	R8018	3012251210	MT-GLAZE 4.7K JA 1/16W
R5840	3012249019	MT-GLAZE 10K JA 1/16W	R8022	3012251210	MT-GLAZE 4.7K JA 1/16W
R5841	3012249316	MT-GLAZE 1K JA 1/16W	R8023	3012645316	MT-GLAZE 2.2 JA 1/10W
R5860	3012248913	MT-GLAZE 100K JA 1/16W	R8029	3012250312	MT-GLAZE 33 JA 1/16W
R5863	3012872227	MT-GLAZE 22K FA 1/16W	R8031	3012250312	MT-GLAZE 33 JA 1/16W
R5864	3012985818	MT-GLAZE 9.1K FA 1/16W	R8032	3012250312	MT-GLAZE 33 JA 1/16W
R5865	3012872227	MT-GLAZE 22K FA 1/16W	R8033	3012250312	MT-GLAZE 33 JA 1/16W
R595	3012250619	MT-GLAZE 5.6K JA 1/16W	R8034	3012250312	MT-GLAZE 33 JA 1/16W
R596	4013441914	MT-GLAZE 10K DA 1/16W	R804	3012249019	MT-GLAZE 10K JA 1/16W
R597	3013158419	MT-GLAZE 47K DA 1/16W	R8043	3012251418	MT-GLAZE 47K JA 1/16W
R598	4013445219	MT-GLAZE 68K DA 1/16W	R8044	3012251418	MT-GLAZE 47K JA 1/16W
R599	3012249316	MT-GLAZE 1K JA 1/16W	R8045	3012409116	MT-GLAZE 5.6 JA 1/16W
R6803	3012249019	MT-GLAZE 10K JA 1/16W	R8046	3012409116	MT-GLAZE 5.6 JA 1/16W
R6804	3012250213	MT-GLAZE 3.3K JA 1/16W	R8047	3012409116	MT-GLAZE 5.6 JA 1/16W
R6812	3012250213	MT-GLAZE 3.3K JA 1/16W	R8048	3012409116	MT-GLAZE 5.6 JA 1/16W
R6813	3012249019	MT-GLAZE 10K JA 1/16W	R8051	3012409116	MT-GLAZE 5.6 JA 1/16W
R6822	3012249316	MT-GLAZE 1K JA 1/16W	R8052	3012409116	MT-GLAZE 5.6 JA 1/16W
R6823	3012249019	MT-GLAZE 10K JA 1/16W	R8053	3012409116	MT-GLAZE 5.6 JA 1/16W
R6856	3012249019	MT-GLAZE 10K JA 1/16W	R8054	3012409116	MT-GLAZE 5.6 JA 1/16W
R6873	3012293913	MT-GLAZE 180 JA 1/16W	R8056	3012251418	MT-GLAZE 47K JA 1/16W
R6874	3012251210	MT-GLAZE 4.7K JA 1/16W	R8057	3012251418	MT-GLAZE 47K JA 1/16W
R7081	3012249019	MT-GLAZE 10K JA 1/16W	R806	3012261516	MT-GLAZE 0.000 ZA 1/16W
R7082	3012258011	MT-GLAZE 330 JA 1/16W	R807	3012249019	MT-GLAZE 10K JA 1/16W
R7083	3012251210	MT-GLAZE 4.7K JA 1/16W	R808	3012249019	MT-GLAZE 10K JA 1/16W
R7084	3012249019	MT-GLAZE 10K JA 1/16W	R8086	3012251210	MT-GLAZE 4.7K JA 1/16W
R7087	3012261516	MT-GLAZE 0.000 ZA 1/16W	R809	3012258516	MT-GLAZE 1.8K JA 1/16W
R7801	3012251210	MT-GLAZE 4.7K JA 1/16W	R8092	3013388113	MT-GLAZE 1.2K FA 1/16W
R7803	3012763010	MT-GLAZE 75K JA 1/16W	R8093	3012944419	MT-GLAZE 1.8K FA 1/16W
R7805	3012251210	MT-GLAZE 4.7K JA 1/16W	R8094	3012943214	MT-GLAZE 47K FA 1/16W
R7817	3012249019	MT-GLAZE 10K JA 1/16W	R8096	3012249316	MT-GLAZE 1K JA 1/16W
R7818	3012994810	MT-GLAZE 2.7K FA 1/16W	R812	3012249316	MT-GLAZE 1K JA 1/16W
R7819	3012646115	MT-GLAZE 20K FA 1/10W	R813	3012249316	MT-GLAZE 1K JA 1/16W
R7821	3012942910	MT-GLAZE 560 FA 1/16W	R8311	3012249712	MT-GLAZE 22 JA 1/16W
R7823	3012261516	MT-GLAZE 0.000 ZA 1/16W	R8313	3012249712	MT-GLAZE 22 JA 1/16W
R7824	3013018010	MT-GLAZE 1.5K FA 1/16W	R845	3012261516	MT-GLAZE 0.000 ZA 1/16W
R7825	3012251210	MT-GLAZE 4.7K JA 1/16W	R846	3012249316	MT-GLAZE 1K JA 1/16W
R7826	3012258110	MT-GLAZE 10 JA 1/16W	R848	3012261516	MT-GLAZE 0.000 ZA 1/16W
R7827	3012258110	MT-GLAZE 10 JA 1/16W	R851	3012249316	MT-GLAZE 1K JA 1/16W
R7828	3012249019	MT-GLAZE 10K JA 1/16W	R852	3012251210	MT-GLAZE 4.7K JA 1/16W
R7829	3012249316	MT-GLAZE 1K JA 1/16W	R8801	3012251418	MT-GLAZE 47K JA 1/16W
R7830	3012249019	MT-GLAZE 10K JA 1/16W	R8802	3012251418	MT-GLAZE 47K JA 1/16W
R7831	3012249316	MT-GLAZE 1K JA 1/16W	R8803	3012251210	MT-GLAZE 4.7K JA 1/16W
R7832	3012250213	MT-GLAZE 3.3K JA 1/16W	R8804	3012251418	MT-GLAZE 47K JA 1/16W
R7833	3012249514	MT-GLAZE 2.2K JA 1/16W	R8805	3012251418	MT-GLAZE 47K JA 1/16W
R7836	3012251517	MT-GLAZE 3.9K JA 1/16W	R8806	3012251418	MT-GLAZE 47K JA 1/16W
R7841	3013368818	MT-GLAZE 6.8K FA 1/16W	R8807	3012251418	MT-GLAZE 47K JA 1/16W
R7842	3012942811	MT-GLAZE 2.2K FA 1/16W	R8808	3012251210	MT-GLAZE 4.7K JA 1/16W
R7843	3012261516	MT-GLAZE 0.000 ZA 1/16W	R8809	3012251418	MT-GLAZE 47K JA 1/16W
R7844	3012258516	MT-GLAZE 1.8K JA 1/16W	R8810	3012249415	MT-GLAZE 1M JA 1/16W
R7845	3012249316	MT-GLAZE 1K JA 1/16W	R8811	3013399515	MT-GLAZE 12.1K FA 1/10W
R7846	3012250213	MT-GLAZE 3.3K JA 1/16W	R8814	3012251210	MT-GLAZE 4.7K JA 1/16W
R7847	3012864717	MT-GLAZE 30K JA 1/16W	R8815	3012251210	MT-GLAZE 4.7K JA 1/16W
R7848	3012249019	MT-GLAZE 10K JA 1/16W	R8816	3012251210	MT-GLAZE 4.7K JA 1/16W
R7863	3012249316	MT-GLAZE 1K JA 1/16W	R8823	3012251210	MT-GLAZE 4.7K JA 1/16W
R7871	3013018010	MT-GLAZE 1.5K FA 1/16W	R8824	3012251210	MT-GLAZE 4.7K JA 1/16W
R7872	3012942910	MT-GLAZE 560 FA 1/16W	R8825	3012251210	MT-GLAZE 4.7K JA 1/16W

Electrical Parts List

Key No.	Part No.	Description	Key No.	Part No.	Description
R8832	3012249316	MT-GLAZE 1K JA 1/16W	RB531	9450370817	R-NETWORK 0X4 1/16W
R8841	3013410616	MT-GLAZE 49.9 FA 1/16W	RB533	9450370817	R-NETWORK 0X4 1/16W
R8842	3013410616	MT-GLAZE 49.9 FA 1/16W	RB534	9450370817	R-NETWORK 0X4 1/16W
R8843	3013410616	MT-GLAZE 49.9 FA 1/16W	RB536	9450370817	R-NETWORK 0X4 1/16W
R8844	3013410616	MT-GLAZE 49.9 FA 1/16W	RB561	9450370817	R-NETWORK 0X4 1/16W
R8845	3012258011	MT-GLAZE 330 JA 1/16W	RB563	9450370817	R-NETWORK 0X4 1/16W
R8846	3012258011	MT-GLAZE 330 JA 1/16W	RB564	9450370817	R-NETWORK 0X4 1/16W
R8850	3012581812	MT-GLAZE 1M FA 1/10W	RB566	9450370817	R-NETWORK 0X4 1/16W
R8851	3012261516	MT-GLAZE 0.000 ZA 1/16W	RB8001	9450490690	R-NETWORK 33X4 1/16W
R8852	3012261516	MT-GLAZE 0.000 ZA 1/16W	RB8002	9450490690	R-NETWORK 33X4 1/16W
R8853	3012258110	MT-GLAZE 10 JA 1/16W	RB8003	9450490690	R-NETWORK 33X4 1/16W
R8854	3012258110	MT-GLAZE 10 JA 1/16W	RB8004	9450490690	R-NETWORK 33X4 1/16W
R9873	3012249019	MT-GLAZE 10K JA 1/16W	RB8006	9450490690	R-NETWORK 33X4 1/16W
R9875	3012249019	MT-GLAZE 10K JA 1/16W	RB8007	9450490690	R-NETWORK 33X4 1/16W
R9876	3012258110	MT-GLAZE 10 JA 1/16W	RB8008	9450490690	R-NETWORK 33X4 1/16W
R9882	3012258110	MT-GLAZE 10 JA 1/16W	RB8801	9450331443	R-NETWORK 4.7KX4 1/16W
R9883	3012261516	MT-GLAZE 0.000 ZA 1/16W	RB8802	9450331443	R-NETWORK 4.7KX4 1/16W
R9884	3012261516	MT-GLAZE 0.000 ZA 1/16W	RB8803	9450331443	R-NETWORK 4.7KX4 1/16W
R9886	3012261516	MT-GLAZE 0.000 ZA 1/16W	RB8804	9450331443	R-NETWORK 4.7KX4 1/16W
R9888	3012249316	MT-GLAZE 1K JA 1/16W	SC1001	9450763503	SURGE-ABSORBER
R9889	3012258110	MT-GLAZE 10 JA 1/16W	SC1011	9450763503	SURGE-ABSORBER
R9890	3012258110	MT-GLAZE 10 JA 1/16W	SC1021	9450763503	SURGE-ABSORBER
R9891	3012258110	MT-GLAZE 10 JA 1/16W	SC1030	9450763503	SURGE-ABSORBER
R9892	3012293913	MT-GLAZE 180 JA 1/16W	SC1041	9450763503	SURGE-ABSORBER
R9893	3012293913	MT-GLAZE 180 JA 1/16W	SC1051	9450763503	SURGE-ABSORBER
R9894	3012258011	MT-GLAZE 330 JA 1/16W	SC1061	9450763503	SURGE-ABSORBER
R9897	3012293913	MT-GLAZE 180 JA 1/16W	SC1071	9450763503	SURGE-ABSORBER
R9898	3012258011	MT-GLAZE 330 JA 1/16W	SC1081	9450763503	SURGE-ABSORBER
R9899	3012293913	MT-GLAZE 180 JA 1/16W	SC1091	9450763503	SURGE-ABSORBER
R9901	3012248814	MT-GLAZE 100 JA 1/16W	SC2011	9450763503	SURGE-ABSORBER
R9902	3012248913	MT-GLAZE 100K JA 1/16W	SC2021	9450763503	SURGE-ABSORBER
R9903	3012248913	MT-GLAZE 100K JA 1/16W	SC2022	9450763503	SURGE-ABSORBER
R9904	3012248913	MT-GLAZE 100K JA 1/16W	SC2023	9450763503	SURGE-ABSORBER
R9907	3012248814	MT-GLAZE 100 JA 1/16W	SC2031	9450763503	SURGE-ABSORBER
R9908	3012248814	MT-GLAZE 100 JA 1/16W	SC2032	9450763503	SURGE-ABSORBER
R9909	3012248814	MT-GLAZE 100 JA 1/16W	SC2041	9450763503	SURGE-ABSORBER
R9914	3012249019	MT-GLAZE 10K JA 1/16W	SC2042	9450763503	SURGE-ABSORBER
R9915	3012249019	MT-GLAZE 10K JA 1/16W	SC2051	9450763503	SURGE-ABSORBER
R9916	3012249019	MT-GLAZE 10K JA 1/16W	SC3801	9450763503	SURGE-ABSORBER
R9918	3012258110	MT-GLAZE 10 JA 1/16W	SC3802	9450763503	SURGE-ABSORBER
RB312	9450370831	R-NETWORK 47X4 1/16W	SC8001	9450763503	SURGE-ABSORBER
RB313	9450370831	R-NETWORK 47X4 1/16W	SC8002	9450763503	SURGE-ABSORBER
RB316	9450370831	R-NETWORK 47X4 1/16W	X1331	6520037212	OSC,CRYSTAL 27.000MHZ
RB318	9450370831	R-NETWORK 47X4 1/16W	X8001	6520037212	OSC,CRYSTAL 27.000MHZ
RB319	9450370831	R-NETWORK 47X4 1/16W	X8801	9450837556	OSC,CRYSTAL 25.0MHZ
RB411	9450370831	R-NETWORK 47X4 1/16W	A200 6550051899 ASSY,PWB,KEY_SW KW4CC		
RB412	9450370831	R-NETWORK 47X4 1/16W	R6801	3012250213	MT-GLAZE 3.3K JA 1/16W
RB413	9450370831	R-NETWORK 47X4 1/16W	R6806	3012249217	MT-GLAZE 15K JA 1/16W
RB414	9450370831	R-NETWORK 47X4 1/16W	R6807	3012349917	MT-GLAZE 6.8K JA 1/16W
RB416	9450370831	R-NETWORK 47X4 1/16W	R6808	3012251517	MT-GLAZE 3.9K JA 1/16W
RB417	9450370831	R-NETWORK 47X4 1/16W	R6809	3012250213	MT-GLAZE 3.3K JA 1/16W
RB418	9450370831	R-NETWORK 47X4 1/16W	R6811	3012251517	MT-GLAZE 3.9K JA 1/16W
RB419	9450370831	R-NETWORK 47X4 1/16W	SW6801	9450262792	SWITCH,PUSH 1P-1TX1
RB421	9450370831	R-NETWORK 47X4 1/16W	SW6803	9450262792	SWITCH,PUSH 1P-1TX1
RB422	9450370831	R-NETWORK 47X4 1/16W	SW6804	9450262792	SWITCH,PUSH 1P-1TX1
RB423	9450370831	R-NETWORK 47X4 1/16W	SW6806	9450262792	SWITCH,PUSH 1P-1TX1
RB424	9450370831	R-NETWORK 47X4 1/16W	SW6807	9450262792	SWITCH,PUSH 1P-1TX1
RB426	9450370831	R-NETWORK 47X4 1/16W	SW6808	9450262792	SWITCH,PUSH 1P-1TX1
RB427	9450370831	R-NETWORK 47X4 1/16W	SW6809	9450262792	SWITCH,PUSH 1P-1TX1
RB428	9450370831	R-NETWORK 47X4 1/16W	SW6810	9450262792	SWITCH,PUSH 1P-1TX1
RB429	9450370831	R-NETWORK 47X4 1/16W	SW6811	9450262792	SWITCH,PUSH 1P-1TX1
RB431	9450370831	R-NETWORK 47X4 1/16W	A601 6550051707 ASSY,PWB,POWER KW4CC		
RB432	9450370831	R-NETWORK 47X4 1/16W	C611	3032221316	CERAMIC 1000P K 1K
RB433	9450370831	R-NETWORK 47X4 1/16W			
RB434	9450370831	R-NETWORK 47X4 1/16W			
RB436	9450370831	R-NETWORK 47X4 1/16W			
RB437	9450370831	R-NETWORK 47X4 1/16W			
RB501	9450370817	R-NETWORK 0X4 1/16W			
RB503	9450370817	R-NETWORK 0X4 1/16W			
RB504	9450370817	R-NETWORK 0X4 1/16W			
RB506	9450370817	R-NETWORK 0X4 1/16W			

Key No. Part No.	Description	Key No. Part No.	Description
C612	3032221316 CERAMIC 1000P K 1K	R611	4013530311 MT-GLAZE 430K JA 1/3W
△ C613	3034514119 MT-POLYEST 1U K 450V	R612	4013530212 MT-GLAZE 360K JA 1/3W
△ C614	3034514119 MT-POLYEST 1U K 450V	R613	3012566314 MT-GLAZE 47K JA 1/10W
C615	4041289509 ELECT 150U M 450V	R614	4021232907 WIRE WOUND CRE IA 0.0
C621	3033363510 CERAMIC 0.47U K 16V	R615	4021220409 MT-GLAZE 680K DD 1/4W
C622	3040914504 CERAMIC 0.047U K 50V	R616	4021220409 MT-GLAZE 680K DD 1/4W
C623	3040901207 CERAMIC 0.01U K 50V	R621	3013261812 MT-GLAZE 8.2K DA 1/10W
C625	3040901207 CERAMIC 0.01U K 50V	R622	3013098517 MT-GLAZE 330 DA 1/10W
C626	3033969613 CERAMIC 1U K 25V	R623	4013608010 MT-GLAZE 470 DA 1/10W
C627	3040913309 CERAMIC 2200P K 50V	R624	3011622912 MT-GLAZE 220 JA 1/10W
C631	3031574215 CERAMIC 220P J 50V	R625	3011622912 MT-GLAZE 220 JA 1/10W
C632	3032454417 CERAMIC 470P K 2K	R626	3012565614 MT-GLAZE 47 JA 1/10W
C633	3032653216 CERAMIC 1000P J 50V	R627	3011505918 MT-GLAZE 10K JA 1/10W
C634	3040913309 CERAMIC 2200P K 50V	R628	3011505918 MT-GLAZE 10K JA 1/10W
C636	4041286300 ELECT 15U M 450V	R629	3012557312 MT-GLAZE 510K JA 1/10W
C641	3040912609 CERAMIC 0.1U K 50V	R630	3012533712 MT-GLAZE 0.000 ZA 1/4W
C643	3040912609 CERAMIC 0.1U K 50V	R631	3012557718 MT-GLAZE 11K JA 1/10W
C651	3034107113 ELECT 100U M 25V	R633	3011506014 MT-GLAZE 0.000 ZA 1/10W
C653	3033701510 CERAMIC 0.1U K 50V	R634	3012561715 MT-GLAZE 33K JA 1/10W
C661	4034454432 ELECT 1800U M 25V	R635	4021221208 OXIDE-MT 0.39JB 1W
C662	3033670410 CERAMIC 0.1U K 50V	R636	3011623018 MT-GLAZE 22K JA 1/10W
C663	3033670410 CERAMIC 0.1U K 50V	R637	3012561715 MT-GLAZE 33K JA 1/10W
C664	3034296708 ELECT 1500U M 10V	R639	3012384314 MT-GLAZE 2.2K JA 1/3W
C665	3034099913 ELECT 470U M 16V	R640	3011506014 MT-GLAZE 0.000 ZA 1/10W
C671	3040912609 CERAMIC 0.1U K 50V	R641	3011505918 MT-GLAZE 10K JA 1/10W
△ C691	3041049502 CERAMIC 1500P M 250V	R642	3012559514 MT-GLAZE 220K JA 1/10W
△ C692	3041049502 CERAMIC 1500P M 250V	R643	3011505918 MT-GLAZE 10K JA 1/10W
D611	4072674909 DIODE FML-S16S	R644	3011505918 MT-GLAZE 10K JA 1/10W
D611D	6520026520 CORE,PIPE	R647	3011505918 MT-GLAZE 10K JA 1/10W
D611E	6520026520 CORE,PIPE	R651	3011505918 MT-GLAZE 10K JA 1/10W
D613	3071630414 DIODE 1SS352-(TPH3)	R652	3012927016 MT-GLAZE 75 FA 1/2W
D614	3070077715 DIODE EU2A-V1	R653	3012927016 MT-GLAZE 75 FA 1/2W
D616	4080657901 DIODE ZRM11C	R662	3011523219 MT-GLAZE 330 JA 1/10W
D617	4080657901 DIODE ZRM11C	R671	3011622417 MT-GLAZE 1.2K JA 1/10W
D631	3071630414 DIODE 1SS352-(TPH3)	R672	3011506212 MT-GLAZE 1K JA 1/10W
D632	3072478827 DIODE RF101L2S	R673	3012642919 MT-GLAZE 12K FA 1/10W
D633	3071468116 DIODE EG01C	R674	3012647518 MT-GLAZE 2.7K FA 1/10W
D641	3072065413 ZD UDZS-TE-178.2B	R675	3011623711 MT-GLAZE 4.7K JA 1/10W
D642	3071791214 ZENER DIODE PTZ13B-TE25	R676	3012642810 MT-GLAZE 1.2K FA 1/10W
D643	3071791214 ZENER DIODE PTZ13B-TE25	R680	3011506014 MT-GLAZE 0.000 ZA 1/10W
D651	3072478827 DIODE RF101L2S	R683	3012650211 MT-GLAZE 390 FA 1/10W
D661	4072698400 DIODE FMEN-210A	R684	3012649314 MT-GLAZE 3.3K FA 1/10W
D662	4072698509 DIODE FMW-2106	R692	3011523219 MT-GLAZE 330 JA 1/10W
D663	3072478827 DIODE RF101L2S	△ RL601	6451010544 RELAY
D664	3072105416 DIODE RB551V-30-TE-17	△ T651	6450976483 TRANS,POWER,PULSE
D669	3072478827 DIODE RF101L2S		
DB611	3072027708 DIODE D10XB60		
△ F631	3240061305 FUSE 250V 2.5A	A602 6550051714 ASSY,PWB,FILTER KW4CC	
IC621	4096907918 IC FA5550N		
IC631	3096537405 IC MR4010-7101	△ C601	4041176403 MT-POLYEST 1U K 275V
IC671	4096922515 IC TA76L431FB	△ C603	3040735109 CERAMIC 470P K 250V
△ L611	6520031838 LINE FILTER	△ C604	3040735109 CERAMIC 470P K 250V
△ L612	6520031821 INDUCTOR,1580UH	△ F601	4230344101 FUSE 250V 6.3A
L613	6520037229 CORE,PIPE	△ L601	6520031845 LINE FILTER
L614	6520037229 CORE,PIPE	△ L602	6520037403 LINE FILTER
L631	9520010131 CORE,PIPE	△ LF601	6450931765 SOCKET,INLET AC 3P
L661	6520037229 CORE,PIPE	△ R601	3012424614 MT-GLAZE 560K JA 1/2W
L662	6520037229 CORE,PIPE	△ R602	3012424614 MT-GLAZE 560K JA 1/2W
L663	6520028500 INDUCTOR 330OHM, P	△ VA601	4080713102 VARISTOR S14K385E2K1
△ PC661	4072657813 PC TLP781F(D4-GB-TP7)		
△ PC663	4072657813 PC TLP781F(D4-GB-TP7)	A603 6550051721 ASSY,PWB,R/C KW4CC	
△ PC671	4072657813 PC TLP781F(D4-GB-TP7)		
PTH611	3080375501 THERMISTOR NTPDB5R0LDHBO	A2901	6451049766 UNIT,REMOCON RECEIVER
PTH641	4080624606 TH PRF18BD471QB1RB	C2901	3033969613 CERAMIC 1U K 25V
Q611	4052275904 TR TK20J50D(F,T)	C2901	3033977618 CERAMIC 1U K 25V
Q611F	6520026520 CORE,PIPE	C2902	3032151019 CERAMIC 470P J 50V
Q622	3051739816 TR 2SC3928A1R	C2903	3033583215 CERAMIC 10U K 6.3V
Q641	3051739816 TR 2SC3928A1R	R2901	3012565614 MT-GLAZE 47 JA 1/10W
Q642	3051739816 TR 2SC3928A1R		
Q651	4052203016 TR ISA1235AC1F		
R610	3012533712 MT-GLAZE 0.000 ZA 1/4W		


Key No. Part No. Description				Key No. Part No. Description			
R2903	3012556513	MT-GLAZE	100 JA 1/10W				
A604 6550051738 ASSY,PWB,TEMP. SENSOR A KW4CC							
C8833	3033969613	CERAMIC	1U K 25V				
C8833	3033977618	CERAMIC	1U K 25V				
IC8811	4106312708	IC MCP9801T-M/SN					
R8856	3011622219	MT-GLAZE	10 JA 1/10W				
R8857	3011622219	MT-GLAZE	10 JA 1/10W				
A605 6550051745 ASSY,PWB,TEMP. SENSOR C KW4CC							
C8813	3033977618	CERAMIC	1U K 25V				
IC8831	4106312708	IC MCP9801T-M/SN					
R8812	3011622219	MT-GLAZE	10 JA 1/10W				
R8813	3011622219	MT-GLAZE	10 JA 1/10W				

Panasonic[®]

Schematic Diagram Circuit Boards Diagram

Models	PT-TW230U
	PT-TW230E
	PT-TW230EA
	PT-TW231RU
	PT-TW231RE
	PT-TW231REA

Important Safety Notice

Components identified by the International symbol  have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

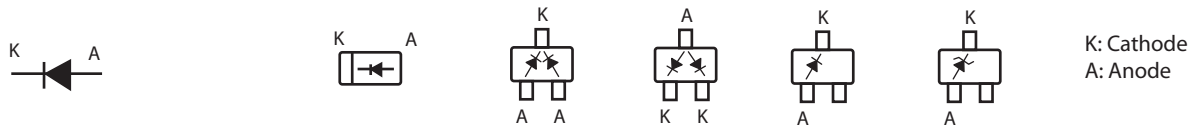
■ COLD and HOT indications

The power circuit board contains a circuit area using a separate power supply to isolate the ground connection. The circuit is defined by HOP and COLD indications in the schematic diagram. Take the precautions below. This schematic diagram is the latest at the time of model production start and subject to change without notice.

■ Precautions

NEVER touch the HOT part or the HOT and COLD parts at the same time, or you may get an electric shock.
NEVER short-circuit the HOT and COLD circuits, or the fuse may blow and the parts may break.
NEVER connect an instrument such as oscilloscope to the HOT and COLD circuit simultaneously, or the fuse may blow.
Connect the ground of instruments to the ground of the circuit being measured.
MAKE SURE to unplug the power cord from the power outlet before removing the chassis.
When ordering parts, please check the part number of the parts list.

- **Diode**



The diagrams illustrate various transistor packages and their internal structures:

- Top Row:** Three physical packages (TO-18, TO-18, TO-18) and three pin configurations (TO-18, TO-18, TO-18) with labels C, B, E, C1, C2, B1, E1, E2, B2, C1, Index.
- Legend:** C: Collector, B: Base, E: Emitter, D: Drain, G: Gate, S: Source.
- Bottom Row:** Three internal structures (TO-18, TO-18, TO-18) and two physical packages (TO-18, TO-18) with labels C, B, E, C1, C2, B1, E1, E2, B2, C1, Index, S, D, G.

Schematic Diagrams

POWER FACTOR CORRECTION

POWER

PROJECTION LENS

R/C

LAMP BALLAST

A901

LP900

IC621
FA555N

IC631
MR4010

HOT

COLD

MAIN


R LCD PANEL

G LCD PANEL

B LCD PANEL

LAMP COVER SW




CAUTION

Components indicated by a mark  in this schematic diagram have the special significance in the safety. It is therefore, particularly recommended that the replacement of those parts must be made by exactly the same parts. Must be used with a specified fuse. Unauthorized substitutions may result in fire or accident.

This projector is isolated from AC line by using the internal converter transformer. Please pay attention to the following notes in servicing.

1. Do not touch the part on hot side (primary circuit) or both parts on the hot and cold sides (secondary circuit) at the same time.
2. Do not shorten the circuit between hot and cold sides.
3. The grounding lead must be connected to the ground of the same circuit when measuring the voltages and waveform.

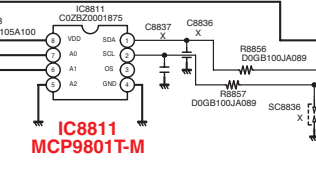
Indication of Signals

	Power Failure, Fan Failure Detection Signals - NO POWER when one of those signals detects a failure.
	Power Drive, Fan Drive Signals - NO POWER when one of those signals has a failure.
	Switch Signals [AV switch, Mute, etc] - NO PICTURE or NO SOUND when one of those signals has a failure.

KEY SW

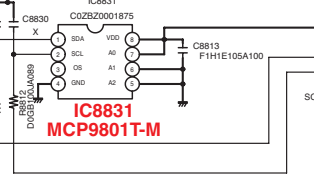
TEMP SENSOR A

TEMP SENSOR A (ROOM)



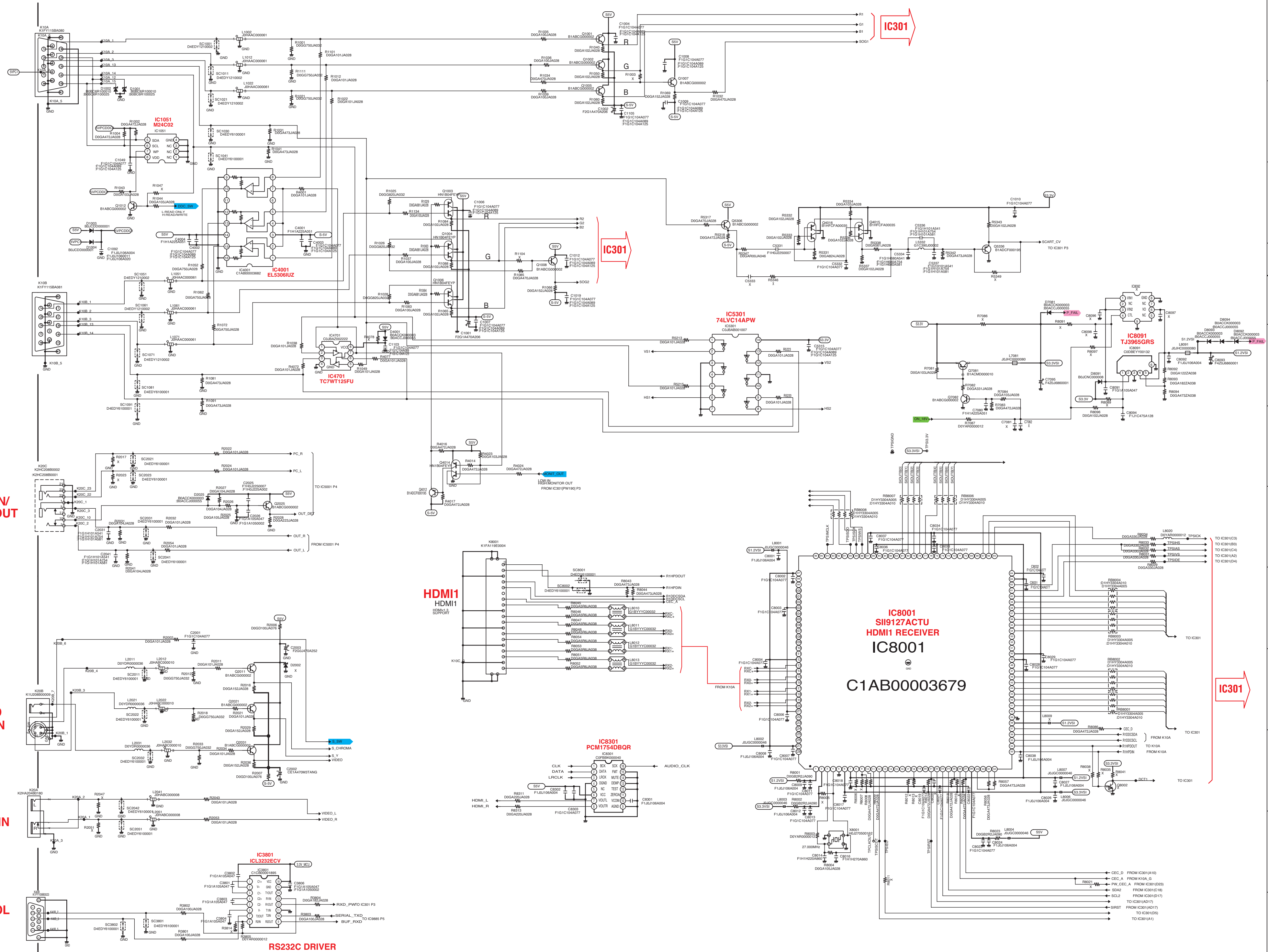
TEMP SENSOR C

TEMP SENSOR C (LAMP)

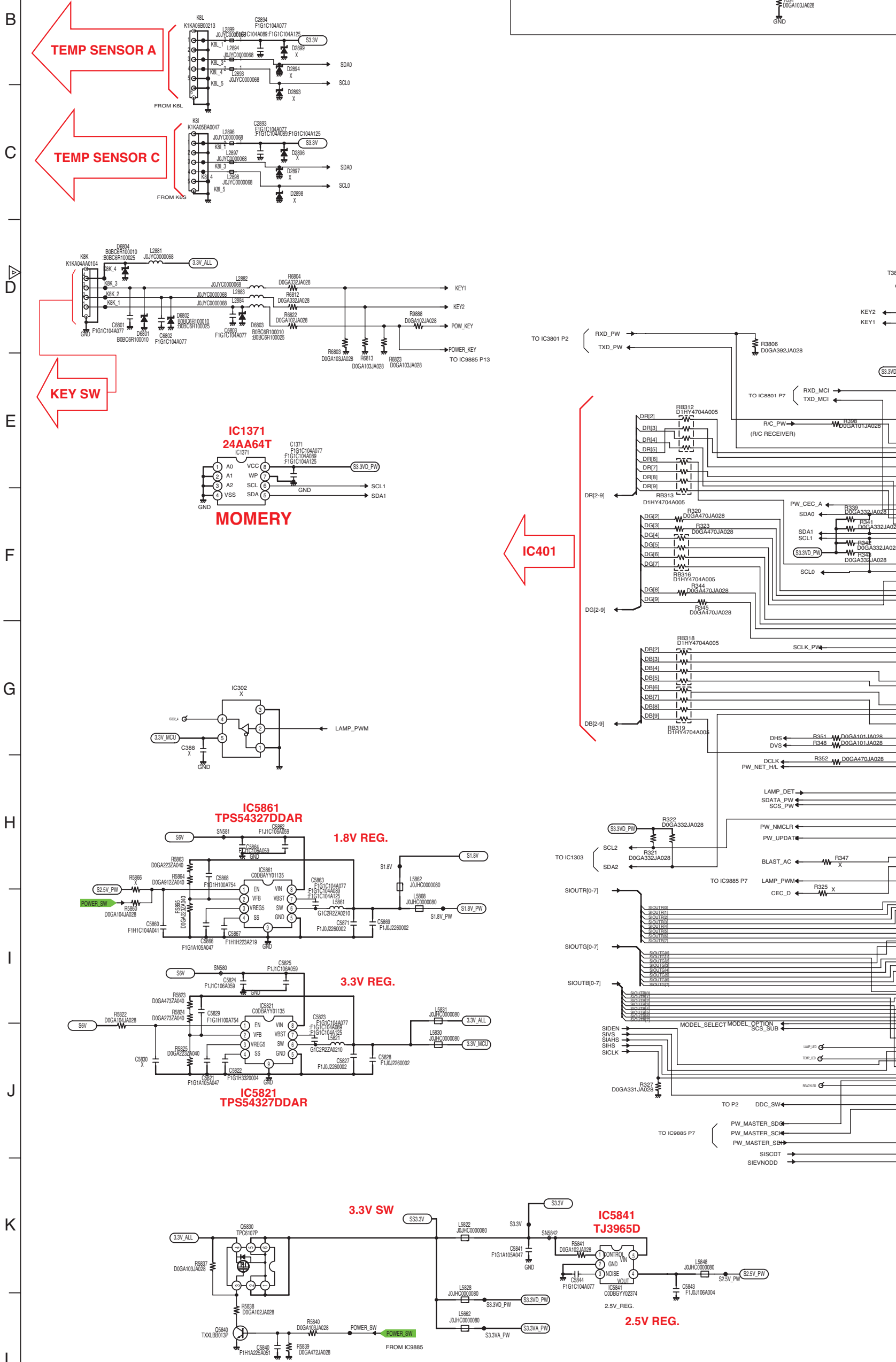


	ADDRESS	A0	A1	A2
SENSOR A	0	1	0	
SENSOR B	1	1	0	
SENSOR C	1	0	0	

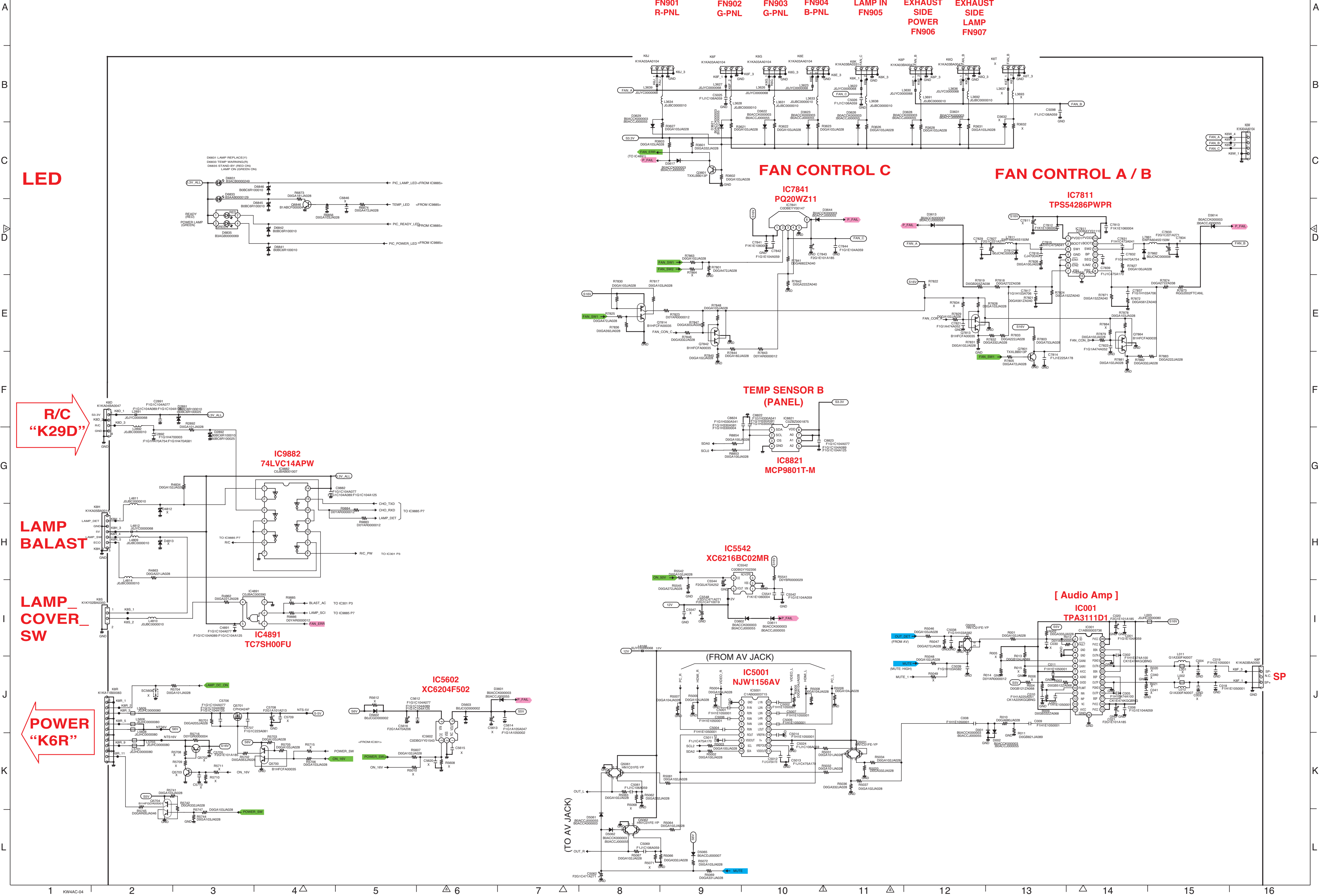
	ADDRESS	A0	A1	A2
SENSOR A	0	1	0	
SENSOR B	1	1	0	
SENSOR C	1	0	0	



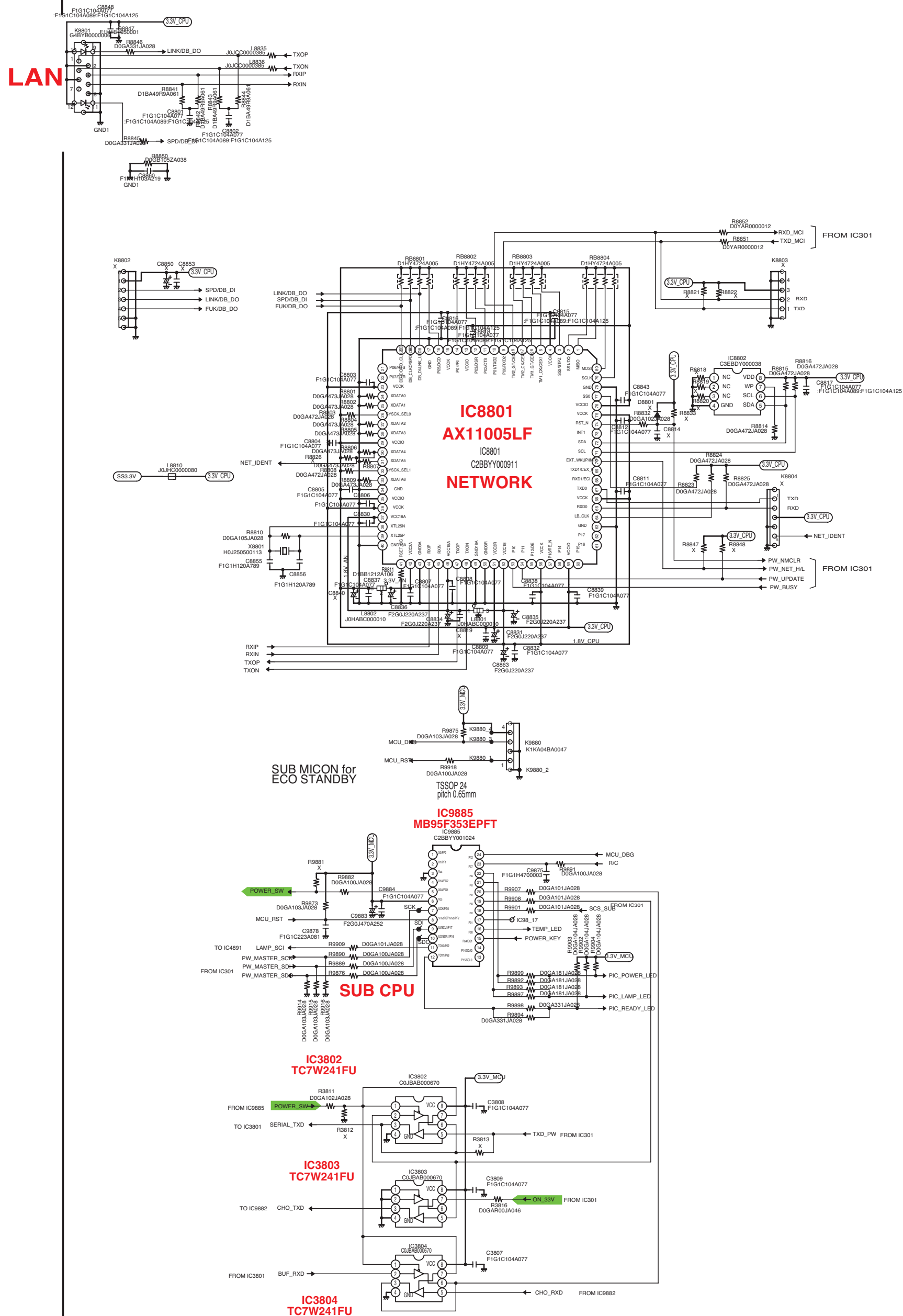
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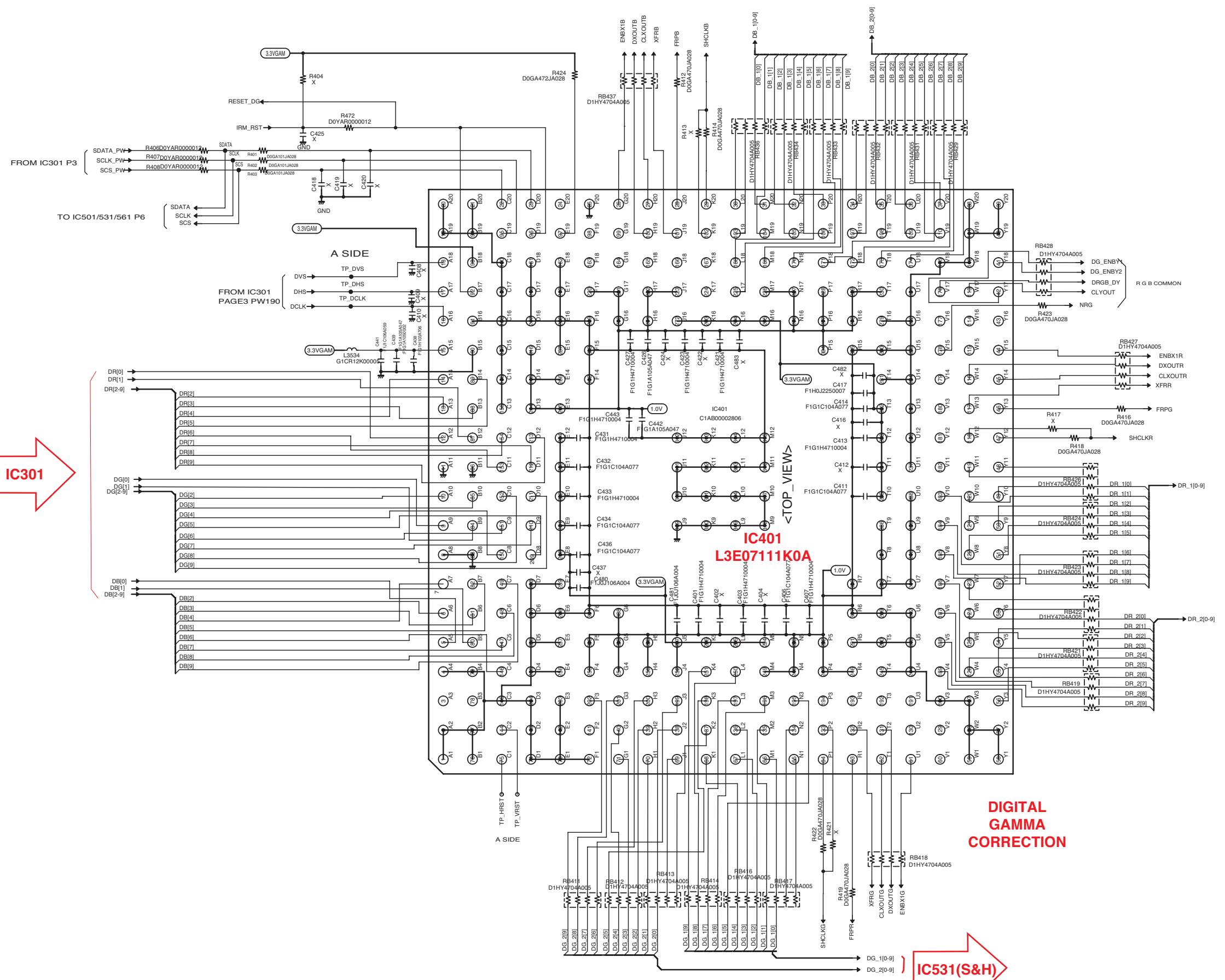
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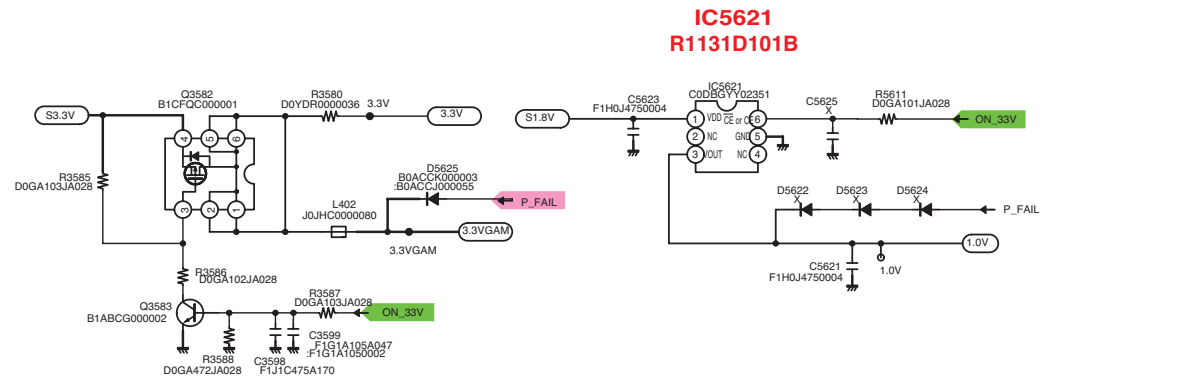
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IC301



IC561(S&H)



A

B

C

D

E

F

G

H

I

J

K

L

A

B

C

D

E

F

G

H

I

J

K

L

(BLUE)

IC401

IC401

IC501
L3E06200
C1A80003478

B-S&H

TP35B

IC592
LM2915IRS5LP

(RED)

IC401

IC401

IC561
L3E06200
C1A80003478

R-S&H

TP35R

(GREEN)

IC401

IC401

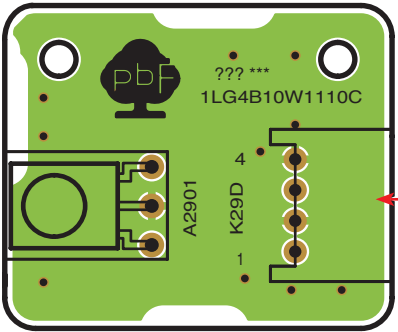
IC531
L3E06200
C1A80003478

G-S&H

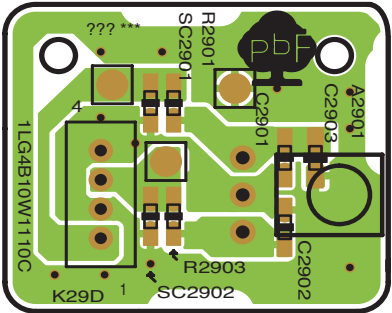
TP35G

Circuit Boards Diagram

RC (SIDE:A)

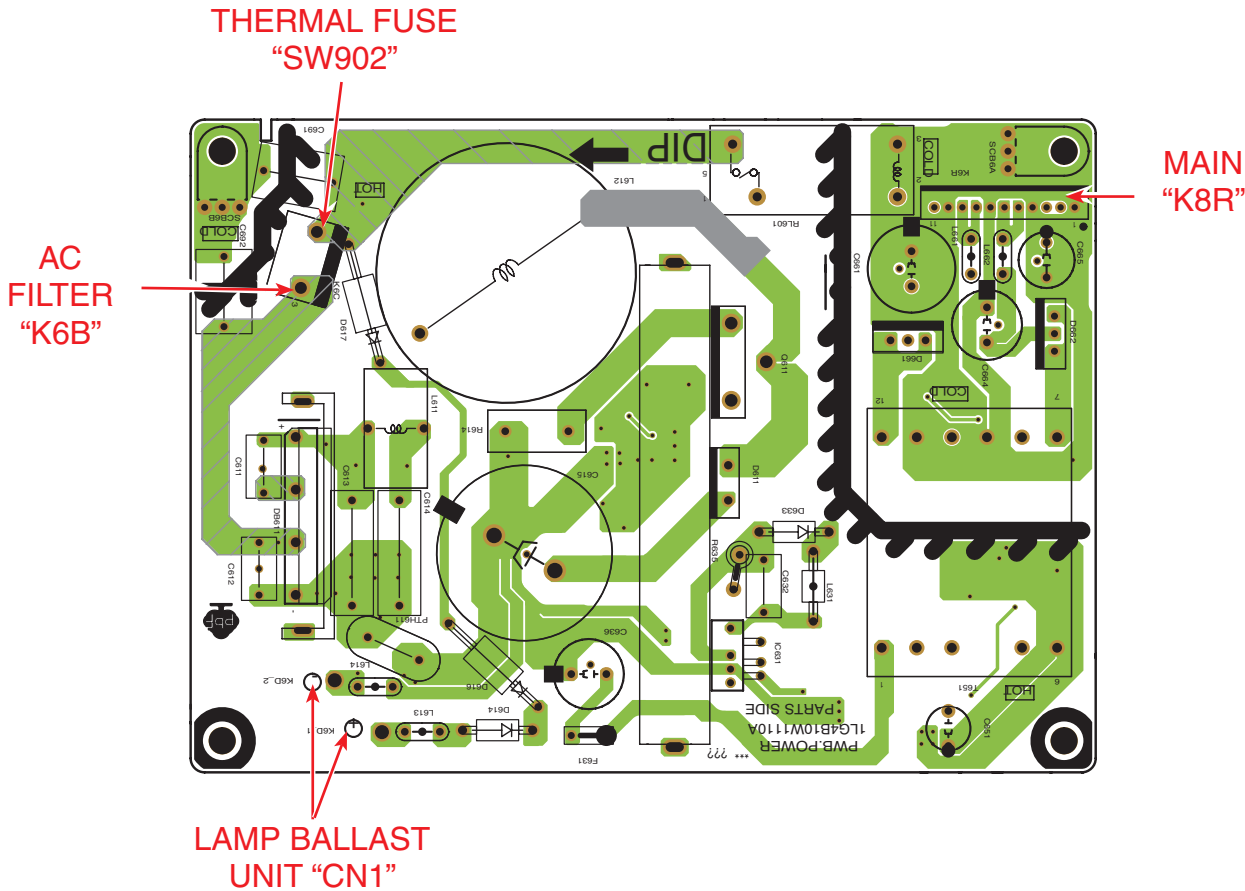


RC (SIDE:B)

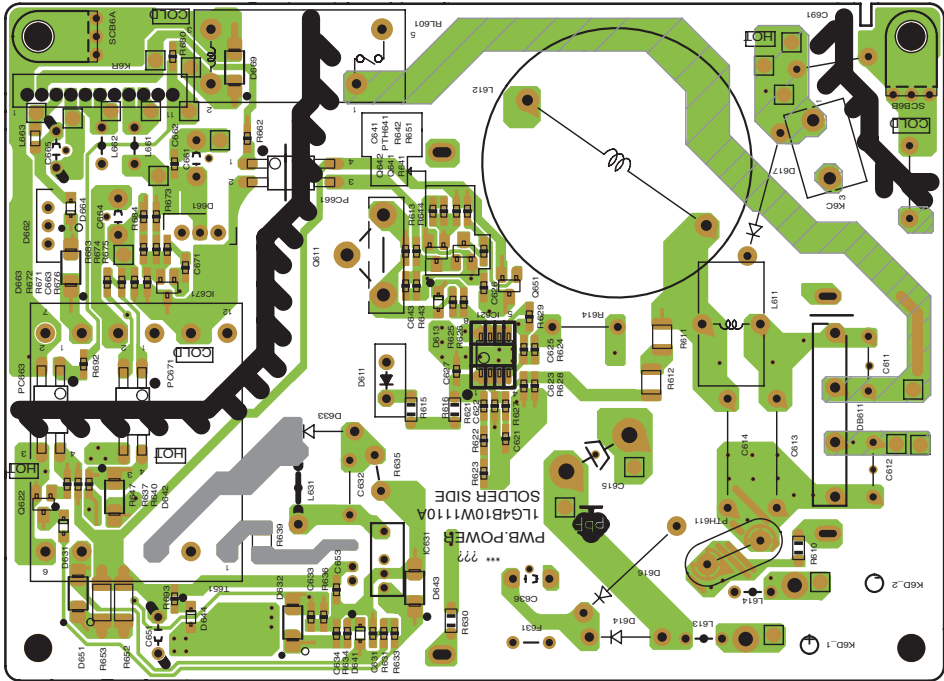


MAIN "K8D"

POWER (SIDE:A)



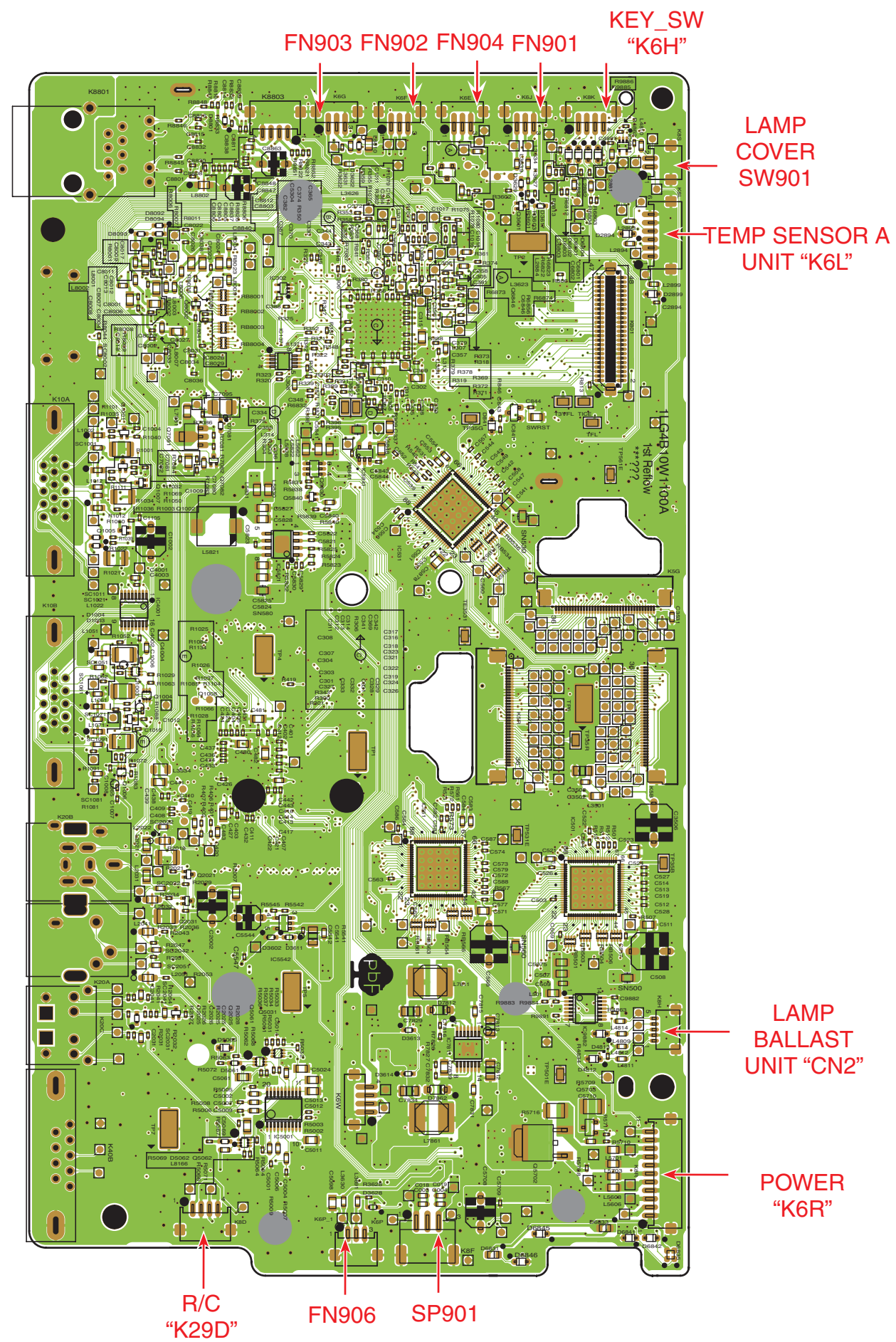
POWER (SIDE:B)



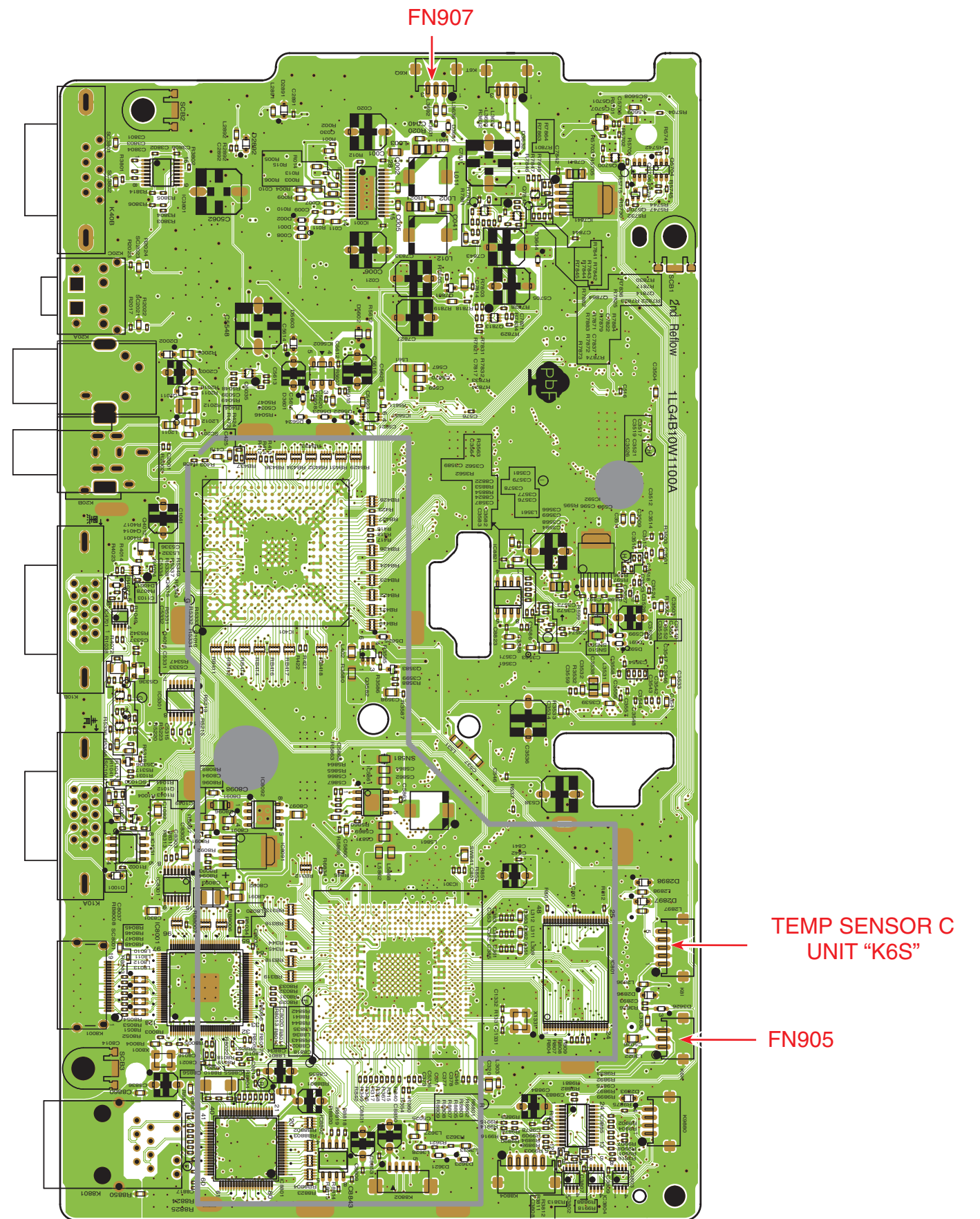
⚠ CAUTION

- This projector is isolated from AC line by using the internal converter transformer. Please pay attention to the following notes in servicing
1. Do not touch the part on hot side (primary circuit) or both parts on hot and cold sides (secondary circuit) at the same time.
 2. Do not shorten the circuit between hot and cold sides.
 3. The grounding lead must be connected to the ground of the same circuit when measuring of voltages and waveforms.

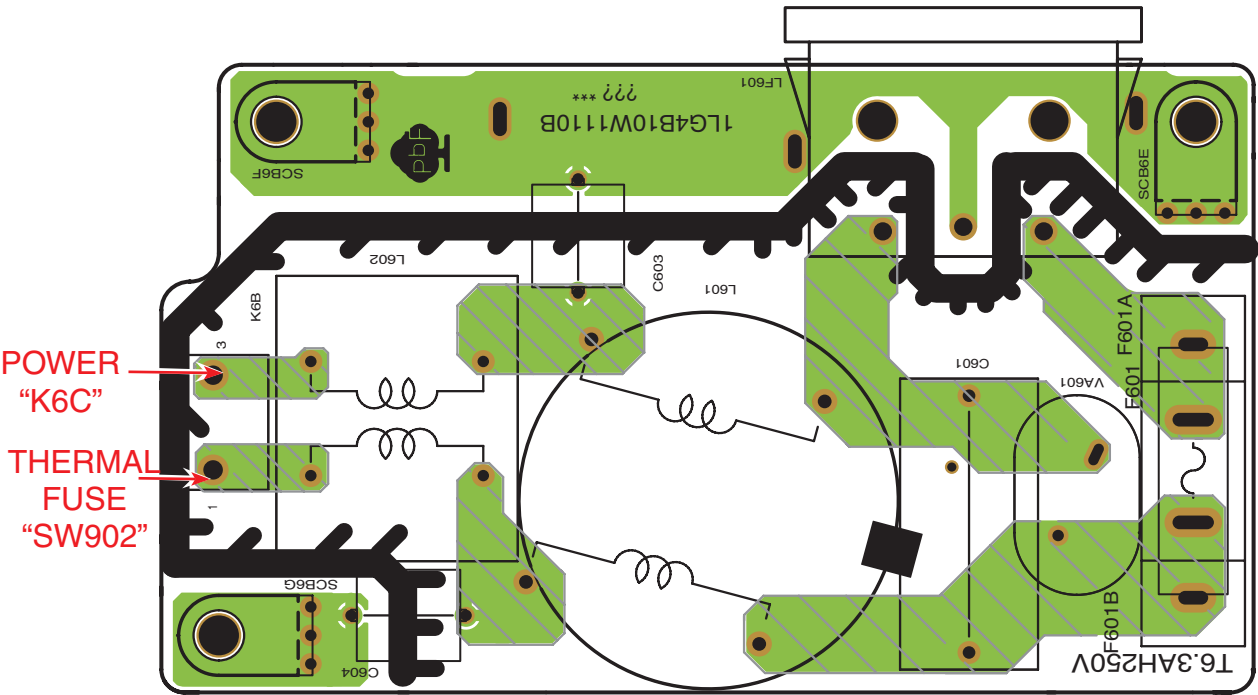
MAIN (SIDE:A)



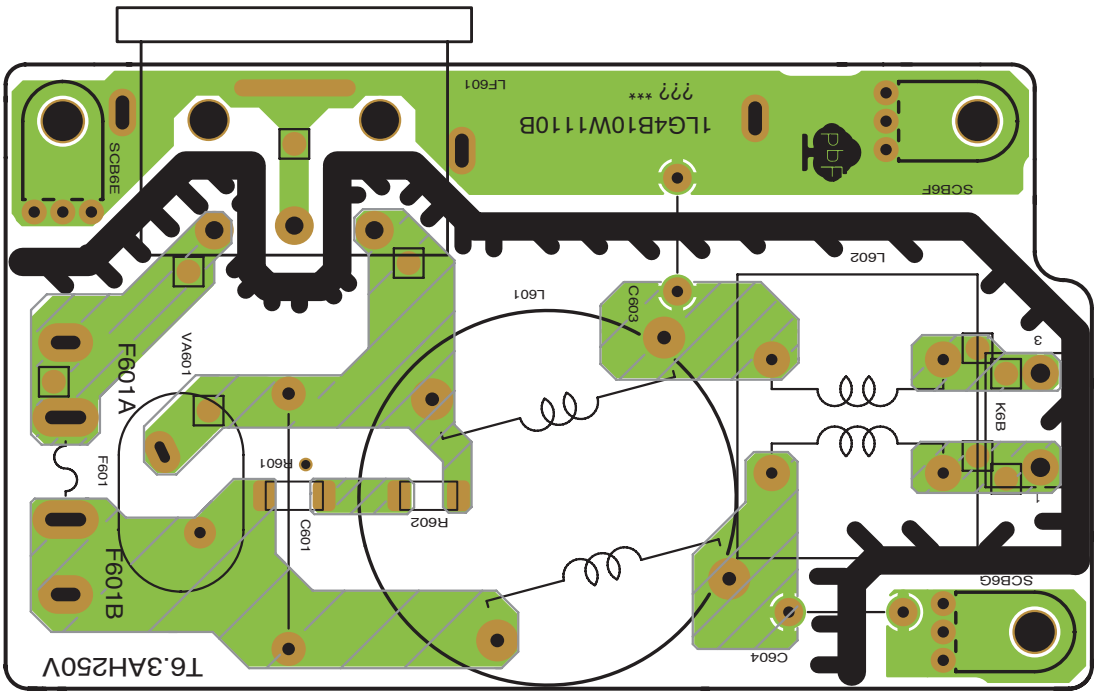
MAIN (SIDE:B)



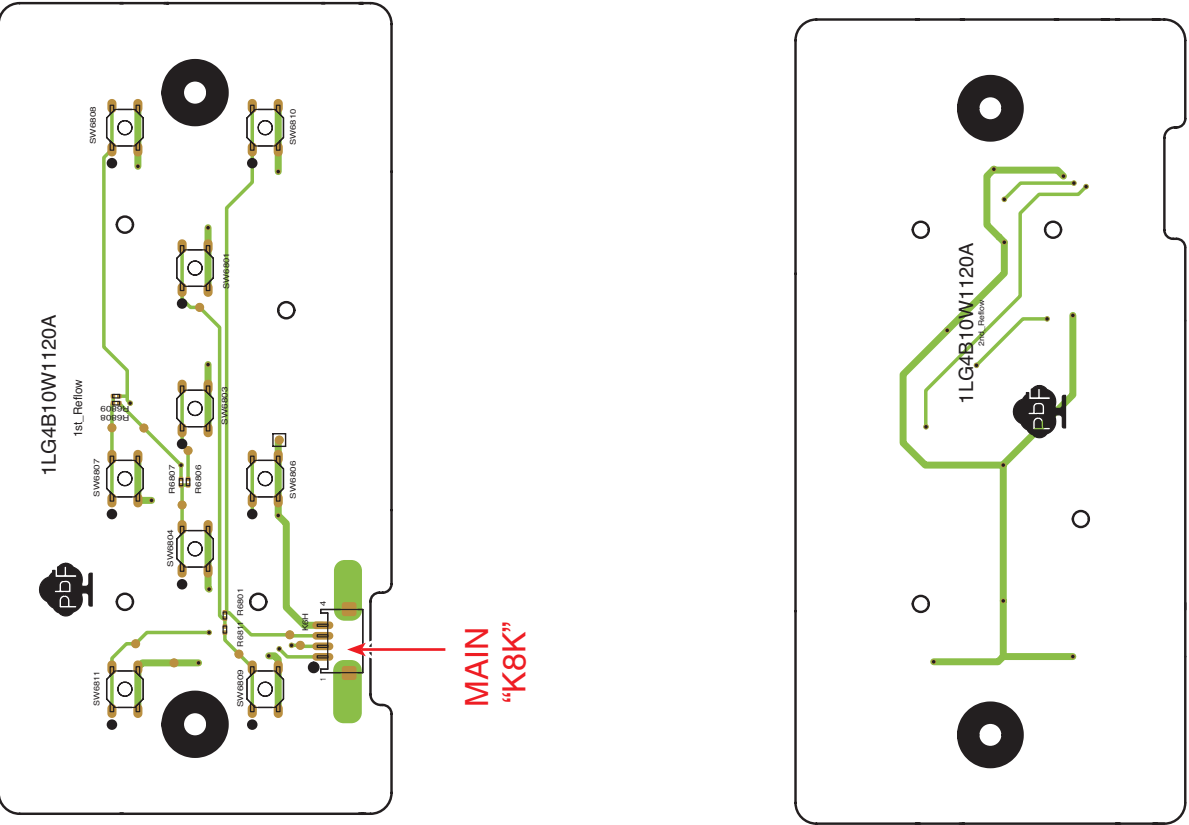
AC FILTER (SIDE:A)



AC FILTER (SIDE:B)



KEY SW (SIDE:A&B)



SENSOR A (SIDE:A&B)



SENSOR C (SIDE:A&B)

